Birth Order: An examination of its relationship with the Big Five personality theory and Trait Emotional Intelligence

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Thesis Declaration

I, Emily Merin Cole confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

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Abstract

This thesis explores the concept of birth order and its relationship with both the Big Five and trait emotional intelligence (EI). These relationships are examined through a series of studies, each differing in sample size and methodology. The hypotheses in this thesis are largely based on the work of Frank Sulloway and his influential book, *Born to Rebel*. Chapter 3 presents a set of meta-analyses on the relationships between birth order and the Big Five. Results suggest that there is no relationship between the variables. In Chapter 4, two between family designs examine birth order and its relationship to the Big Five and trait EI. The results from these studies reveal that oldest and younger borns score significantly higher than middle borns on Extraversion and Openness, and that there is no relationship between birth order and trait EI. A more comprehensive examination (of the relationship) between birth order and trait EI is conducted in Chapter 5 and finds that there is no relationship between the two variables when assessed in a between family design. The thesis concludes with a final study on birth order and its relationship with the Big Five and trait EI using a within family design; 126 sets of siblings from three sibling families participated in this study. Results showed that first borns scored significantly higher than last borns in Conscientiousness and that middle borns scored lower than both first borns and last borns in Neuroticism. This study also found no relationship between birth order and trait EI. Overall, this thesis found conflicting evidence of birth order effects on the Big Five suggesting that differing methodology and other confounding variables make this difficult to draw definitive conclusions on the relationship between the variables. However, this thesis found consistent evidence that there is no relationship between birth order and trait EI.

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Chapter 1: Brief Overview of Thesis

1.1 Introduction

The purpose of this thesis is to investigate the popular topic of birth order and examine how much or how little it impacts human personality. This examination will be done through a series of studies presented throughout the various chapters in this book. In this thesis, birth order is defined as the ordinal position a sibling is in relation to his or her siblings. Throughout this thesis birth order is most commonly categorized as an individual being a first born or later born. First borns are the eldest and sometimes the only child when specified as such, while later borns include all individuals who have at least one older sibling. In several studies a third category, middleborns, are included and these individuals all have both older and younger born siblings.

1.2 The popularity of birth order theories

Birth order is a topic that receives a great amount of attention both in the academic circles, as well as the media and mainstream society. One source of its popularity is that it is relatable to everyone across all cultures. Whether you are an only child or the youngest of eight, everyone has an ordinal position they identify with and it often becomes a personal label. The birth order labelling begins at a very young age as parents, family members and other adults in a child's life start to refer to the child as such. Often this labelling is attached to a cause and effect: e.g., *Max doesn't like to share because he is an only child,* or *David likes rough play, but you know he has three older brothers*. These types of statements are echoed throughout families as people enjoy speculating on how different sibship structures can affect a child's behaviour.

In some families, however, birth order labels are not so straightforward. When it comes to blended families, where there are step-siblings, half-siblings, foster or adopted siblings, birth order can become complicated. In these circumstances, individuals find themselves hard pressed to place themselves in one specific category. For the purpose of the present thesis, the individuals who fall into this *other* category were removed from the sample and their data was not included in the analysis. This was done to ensure that there was consistency among the birth order groups. Birth order research is loaded with many outside variables, as will be discussed in Section 2.2.1, by defining birth order groups as individuals who are 100% biologically related one important variable, genetics, can be controlled for.

1.3 Approach and Aims of the Thesis

Birth order research has explored not just personality but a breadth of other variables as well. Much of the research generated speculates on the links between birth order to different personality traits, leadership skills and occupations (Andeweg & Van Den Berg, 2003; Leong, Hartung, Goh & Gaylor, 2001; Watkins, 1984). A review of the literature on birth order and personality is discussed in detail in Chapter 2. Birth order research extends beyond just personality. More specifically, Andeweg and Van Den Berg (2003) found more political leaders to be only children and first borns than middle or last born. Differences in vocational preference have also been reported. In a group of medical school students Leong et al., (2001) found that later born children tend to prefer more physical, practical, emotional and expressive vocations than first borns. While there is a great deal of birth order literature surfacing over the years, there lies a great inconsistency in the nature of the relationships between birth order and these

variables. One of the central aims of the following studies is to approach this issue by examining birth order effects on personality using a variety of methodologies, as well as incorporating a meta-analysis to assess differences in previous research.

While much of the previous literature on birth order effects on personality focuses on the Big Five, this thesis differs in that it also incorporates trait emotional intelligence (EI). The studies presented in this thesis are the first to examine birth order differences in trait EI, and therefore this is an important contribution to the field of trait EI and psychology as a whole.

1.4 Why investigate the Big Five and Trait EI?

1.4.1 What are the Big Five?

The concept of individual differences can be traced as far as 2,500 years ago to Tyrtamus of Lesbos (Morley, 1981) who described personality dimensions that fit into categories similar to the ones created in the late 20th century (John, 1990; Wilt & Revelle, 2009). The topic of personality has been conceptualized from many theoretical perspectives each offering unique contributions to the field of individual differences. The trait theory of personality is one of the most widely used and within the trait theory schools of thought differ both in terms of the number of traits, as well as the appropriate scale of measurement. Several taxonomies of personality have been proposed; one of the most popular is Costa and McCrae's (1992) Five-Factor Model (FFM), which includes Neuroticism, Extraversion, Openness, Conscientiousness and Agreeableness--known collectively as the 'Big Five'. This model includes the five personality traits as well as six facets within each trait (Costa, McCrae & Dye, 1991; Costa & McCrae, 1995) as displayed in Table 1.1 and discussed in more detail in the rest of this section.

Table 1.1
The Big Five and their Facets (adapted from John, 1990)

Traits	*High scorers view themselves as…*
Neuroticism	
Anxiety	…apprehensive, nervous, and worried about themselves and others.
Anger Hostility	…antagonistic and lacking sympathy in others.
Depression	…sad and feeling hopeless in their outlook on life.
Self-Consciousness	…hung up on how others perceive them.
Impulsiveness	…spontaneous in decision making.
Vulnerability	…helpless and exposed.
Extraversion	
Warmth	…kind, friendly and hospitable to others.
Gregariousness	…sociable and enjoys the company of others.
Assertiveness	…forceful in getting what they want.
Activity	…active with lots of interests and hobbies.
Excitement Seeking	…enthusiastic and enjoys stimulation.
Positive Emotions	…upbeat and sees the bright side of things.
Openness	
Fantasy	…whimsy and dreamy.
Aesthetics	…interested in art and beauty.
Feelings	…open to the feelings and beliefs of others.
Actions	…active participants in life.
Ideas	…generating and being open to new experiences and ideas.
Values	…having moral standards and principles by which they lead their life.
Agreeableness	
Trust	…trusting and benevolent to others.
Straightforwardness	…direct and frank in dealing with others.
Altruism	…selfless with great concern for others.
Compliance	…deferring to others when conflicts arise
Modesty	…not preoccupied with themselves.
Tender-Mindedness	…being guided by feelings when making judgments and forming attributes.
Conscientiousness	
Competence	…capable, sensible and accomplished.

Order	…tidy and well-organized.
Dutifulness	…aiming to adhere to high standards of conduct.
Achievement Striving	…needing to achieve.
Self-Discipline	…persistent and able to continue with a task despite distractions.
Deliberation	…cautious and thoughtful in making and caring out plans.

1.4.1.1 Neuroticism

Highly neurotic individuals tend to score high in a combination of some or all of the facets listed in Table 1.1. These individuals can display a lot of anxiety and hostility towards others while individuals who are low in neuroticism are less anxious and easy-going. While this trait often has negative connotations, some of the facets are important for all individuals in moderate amounts, such as being vulnerable, impulsive and self-conscious. While having high scores in these three facets have negative implications, they do represent an important part of natural human behaviour. For example, to be self-conscious implies one possesses self-awareness, an important skill when interacting with other individuals both in the home and the workplace.

This trait is associated with negative affect and is negatively correlated with happiness (Argyle & Lu, 1990; Cheng & Furnham, 2002). More specifically, individuals high in neuroticism are more likely to experience negative affect (Gross, Sutton, & Ketalaar, 1998) while individuals low in neuroticism are more likely to experience feelings of happiness. High neuroticism is correlated with anxiety and depression (Jylha & Isometsa, 2006) as well as low job satisfaction and loneliness (Cheng & Furnham, 2002; Furnham & Zacherl, 1986). As in all of the personality traits discussed here, an individual could score high on one of the facets and score low on the rest yielding an overall moderate score for the trait as a whole.

1.4.1.2 Extraversion

While the concept of extraversion has been around for centuries, it was not until the early 20th century that Carl Jung is given credit for bringing the terms extraversion and introversion into popularity (Wilt & Revelle, 2009). Unlike the continuous trait theory emphasised in this thesis, Jung conceptualised a dichotomy made up of individuals who were either introverts or extraverts (Jung, 1921). He believed that introverts, as the name suggests, focus more on their own inner world while extraverts exert their energy externally in the world around them.

Individuals who score high on extraversion tend to be outgoing and enjoy the company of others. They also tend to have a more positive view of the world; as opposed to individuals low on extraversion, high extraverts judge neutral events more positively (Uziel, 2006). Studies have found evidence supporting the positive relationship between extraversion and positive affect (Gross et al, 1998). However, being an extravert involves more than just enjoying being happy and the centre of attention. As reflected in Table 1.1, these individuals also encompass a combination of the facets including excitement seeking which means they are more likely to be risk takers.

1.4.1.3 Openness to Experience

According to Costa and McCrae (1992), this trait involves the tendency to fantasize, be aware of one's emotions, a preference for novelty, sensitivity to art and beauty, intellectual curiosity and a tendency to be liberal in values. This trait manifests as creativity, imaginativeness, curiosity, and aesthetic appreciation. Openness implies a willingness to adopt novel and unconventional ways of thinking and behaving. Individuals who are high in openness display flexible behaviour, while those low in this

trait are set in their ways, traditional in their values and shallow in affect. Low scorers prefer straightforward and obvious over complex, ambiguous and subtle.

Research shows that this trait corresponds with academic performance (Chamorro-Premuzic & Furnham, 2008), interracial attitudes and impression formation (Flynn, 2005), and presidential leadership (Simonton, 2006). According to Ones, Rubenzer and Faschingbauer (2004), openness to experience correlates with presidential success more than any of the other Big Five traits. This is most likely attributed to the actions and ideas facets of the openness trait. They report that the trait also correlates with ethics on the job, which is fitting as *values* is one of the facets of openness. This trait is also correlated with a number of other occupational factors such as training (Barrick & Mount, 1991) and job performance (Bing & Lounsbury, 2000). These studies all suggest that an individual who is high in openness will have multiple benefits in their career path.

1.4.1.4 Agreeableness

Individuals who score high on this trait tend to be easy going. On the other hand, individuals who score low on this trait have a tendency towards rigid thinking and behaviour; they have trouble assimilating and changing their routines. Agreeableness is correlated with lack of stress and greater efficacy (Little, Lecci & Watkinson, 1992). By being agreeable, one is not concerned with controlling situations and tends to have more of a *go with the flow* type of attitude. In addition to lower stress, agreeableness is correlated with a number of health and lifestyle variables. Laursen, Pulkkinen and Adams (2002) found that adults who scored high on this trait reported less alcoholism and depression than adults low in agreeableness. They also found that the high agreeableness individuals reported fewer arrests and more career stability. The lower

arrest rate may be attributed to the compliance facet of agreeableness as these individuals follow the rules and are not confrontational or aggressive.

This trait is also associated with being an important skill in relationships. Botwin, Buss and Shackelford (1997) found that individuals with a partner high in agreeableness are more satisfied with their marriage. In fact, according to Furnham and Heaven (1999), agreeableness is the best predictor (of the Big Five) for both marital satisfaction and sexual satisfaction. Logically, the rationale being that in order to sustain a happy partnership the individuals must possess agreeableness facets such as trust and tender-mindedness.

1.4.1.5 Conscientiousness

This trait refers to an individual's desire to achieve and succeed. Individuals high in this trait are competent and orderly, and determined to assert their best effort. Conscientiousness most consistently predicts both academic performance (Chamorro-Premuzic & Furnham, 2008) as well as discipline choice (Furnham & Heaven, 1999). In other words, this trait not only predicts how well the individual does in a subject, but their choice of subject as well. Individuals with high conscientiousness scores tend to study economics, law and natural sciences while individuals with low scores on this trait tend to take up education, history and psychology (Furnham & Heaven, 1999).

While most would associate conscientiousness with scholastic endeavours, the facets that encompass the trait can be applied to other settings as well. For example, a prima ballerina must be disciplined and dutiful to achieve that status in his or her career. Conscientiousness is also positively correlated with job performance and success (Barrick & Mount, 1991). Interestingly and somewhat surprisingly, conscientiousness is negatively correlated with intelligence (Furnham, Chamorro-Premuzic, & Moutafi,

2005; Moutafi, Furnham. & Crump, 2003; Moutafi et al., 2006; Moutafi, Furnham, & Paltiel, 2003; Moutalfi et al., 2004). The rationale behind this finding, according to Moutafi et al, 2003, is that in a competitive environment, less intelligent individuals compensate by being more conscientious.

1.4.1.6 Measuring the Big Five

1.4.1.6.1 The NEO-PI-R Inventory

While the Big Five theory is widely accepted throughout the field of personality psychology, an agreed form of measurement is not (Costa & McCrae, 1995). There are many scales to assess personality traits, all varying slightly in either length or inclusion of facets. One of the most popular is the NEO Personality Inventory Revised (NEO-PI-R; Costa & McCrae, 1992), which consists of 240 items and yields scores for each of the Big Five domains and the six facets for each trait. The scale shows good internal consistency and has been distributed worldwide in many different languages. The fact that the scale shows strong cross-cultural stability provides evidence for its validity. Additionally, Costa and McCrae (1992) report high convergent and discriminant validity of the NEO-PI-R.

However, despite its popularity worldwide, the NEO does not go without criticism. One limitation of the NEO-PIR is that it is lengthy (John & Srivastava, 1999) and takes approximately 30-40 minutes to complete (Costa & McCrae, 1992). In order to provide an alternative shorter measure, Costa and McCrae (1992) developed the abbreviated 60-item version known as the NEO-FFI. Though the scales on this measure correlate well with the NEO PIR, the scales do not equally represent each of the facets that define each factor (John & Srivastava, 1999). In other words, some of the scales contain a different amount of items to represent each of the facets. One example is

agreeableness where there are five items from the altruism facet and none for modesty (John & Srivastava, 1999). Though the NEO is a popular scale, other instruments have been developed in order to compensate for some of the limitations of the NEO. One such scale is described below in Section 1.4.1.6.2.

1.4.1.6.2 The IPIP

The studies presented in this thesis all assess the Big Five via the International Personality Item Pool (IPIP; Goldberg, 1999). In addition to the high validity and reliability, this scale has proved to be very popular for a variety of reasons (Goldberg et al., 2006). The scale is available and can be obtained instantly on the Internet. Unlike some other measures found on the Internet, the scoring keys are readily available as well. The cost of this instrument is free making it accessible to anyone with an Internet connection and it has so far been translated into over 25 languages (Goldberg et al., 2006). Another advantage the IPIP has over other measurements is that it allows researchers to reorder, reword or translate the items into other languages without requiring permission from the author. The accessibility of the scale in addition to the length and psychometric properties make the IPIP very appealing to researchers and are the reasons this scale was chosen as the main instrument by which to measure the Big Five throughout this thesis.

Lim and Ployhart (2006) examined the construct validity of the IPIP by comparing it to the NEO-FFI. The researchers found that the scale presents a good fit for the five-factor model in line with Goldberg (1999). Additionally, their study found strong support for the convergent and discriminant validity of the IPIP and evidence that it can be interchangeable with the NEO-FFI. Other support for the IPIP comes from Guenole and Chernyshenko (2005) who examined the dimensionality, bias and

criterion validity of the scale in a New Zealand based study. They found good construct and criterion validity for the IPIP, as well as little evidence of measurement bias.

One key difference between the IPIP and other personality measures lies in its Internet-based free implementation. While most personality measures are available online, the IPIP is free to both administer and to score. According to Buchannon (1999), online measures have advantages for both the researcher and the participants. By circulating a questionnaire in a web-link over the Internet, through email, list-serves, and social networking sites it is likely to gain a larger sample size than simple advertising through a local University. In addition to the sample size, it is not difficult to generate a multi-national sample that is diverse in age and background. The measures are inputted into a data file allowing for complete anonymity for the participant. Buchannon (1999) asserts that this may make the participants engage in greater self-disclosure and be more honest. Therefore, the studies presented in this thesis will all use the IPIP as it displays advantages above and beyond the likes of the NEO-PI-R and the NEO-FFI.

1.4.1.6.3 Validity of self-report measures

While self-report measures of personality are often easy to administer, this methodology has been criticized in the past for the potential of social desirability bias as well as the influence of current mood (Sandvik, Diener, & Seidlitz, 1993). There is a general concern that people answer how they want others to see them rather than how they see themselves. To compensate for this potential bias, many psychometrically valid scales (including the IPIP) allow the researcher to assess social desirability bias. This scale lies within the measure, unbeknownst to the participant, and allows the researcher to determine which participants are answering in a socially desirable manner

(McBurney, 1994).

Other concerns about the validity of self-report measures include the potential for people to misunderstand items or answer haphazardly (Costa & McCrae, 1997). To assure these limitations do not affect the results in the studies presented in this thesis, proper precautions were made before and after administering the measures. One reason a participant may misunderstand items on the scale is language barriers. For this reason every participant in all studies presented in this thesis were asked if English was their first language as all measures were distributed in English. Analyses were run twice, once including all participants and again with only the native English speakers. If there was a significant difference in scores between the analyses, it was assumed that the non-native English speakers had difficulty in understanding items and were therefore removed from the sample. To combat the second concern, participants answering indiscriminately, all items on the personality measures were asked twice with the second time being in the inverse. Therefore, if a participant responded on one end of the scale to one item, it is assumed that they would answer at the other end of the scale when the item is inverted. The Big Five is just one set of personality traits being assessed in this thesis.

1.4.1.7 Alternatives to the Big Five

While the Big Five theory on individual differences is widely accepted and commonly referenced, it comes after significant amounts of research from earlier trait psychologists. One of the earlier trait psychologists was Hans Eyesenck (1916-1997) and this three-factor theory of personality. Eysenck gave participants long lists of adjectives and factor analysed them to determine which factors carried the most weight. He ascertained that these factors were the following dimensions: introversion-

extraversion, neuroticism and psychoticism. Out of this theory the measurement scale the Eysenck Personality Indicator (EPI) was created and while it is used in research, critics find both Eysenck's theory and the EPI too limiting and assert that these three traits do not fully encompass the human personality.

Another psychologist who developed his framework of personality theory through factor analysis is Raymond Cattell (1905-1988). Cattell's (1946) systematic work and factor analysis led to his own model of individual differences consisting of 16 primary factors and 8 second-order factors (Catttell, Eber & Tatsuoka, 1970). Each individual according to Cattell consists of each of these traits to some degree. They include: abstractedness, apprehension, dominance, emotional stability, liveliness, openness to change, perfectionism, privateness, reasoning, rule-consciousness, self-reliance, sensitivity, social boldness, tension, vigilance and warmth, (Cattell, 1946). There is some overlap with Eysenck's three factors and the addition of others as well, however, according to Digman (1990), this model is too complex and a similar model such as the Big Five is necessary.

The HEXACO model is considered a viable alternative to the Big Five (Ashton & Lee, 2007) and measures six factors: Honesty-Humility (H), Emotionality (E), eExtraversion (X), Agreeableness (A), Conscientiousness (C) and Openness to Experience (O). The HEXACO-PI-R consists of 100 questions self-report measure that assesses four factor-level scales within each of the four factors (Lee & Ashton, 2004) as listed in Table 1.3. Lee and Ashton (2004) report that the HEXACO-PI-R shows high levels of internal consistency reliabilities and validity on the factor levels.

Table 1.2

HEXACO Domains and Sub-scales (Adapted from Lee & Ashton, 2008)

Honesty-Humility	
	Sincerity
	Fairness
	Greed Avoidance
	Modesty
Emotionality	
	Fearfulness
	Anxiety
	Dependence
	Sentimentality
Extraversion	
	Social Self-Esteem
	Social Boldness
	Sociability
	Liveliness
Agreeableness	
	Forgiveness
	Gentleness
	Flexibility
	Patience
Conscientiousness	
	Organization
	Diligence
	Perfectionism
	Prudence
Openness to Experience	
	Aesthetic
	Inquisitiveness
	Creativity
	Unconventionality

This measure, while relatively new, has been utilized to assess a variety of variables including integrity (Lee, Aston, Morrison, Cordery, & Dunlop, 2008), the personality of criminal offenders (Rolison, Hanoch, & Gummerum, 2013), the dark triad (Lee & Ashton, 2005) and sensation-seeking and risk-taking (de Vries, de Vries, & Feij, 2009) just to name a few. Ashton and Lee (2007) argue that the HEXACO model

accommodates several personality variables that the Big Five cannot, including the Honesty-Humility and Emotionality factors. While the HEXACO model provides an alternative to the Big Five, there is a lack of research on the relationship between birth order and the HEXACO. Although the Big Five theory has its limitations and critics, it remains the most widely tested structure in the space (Saucier & Goldberg, 2001) and most robust (Goldberg, 1981) and will therefore be the main point of focus of the studies in this thesis. This chapter continues with a detailed discussion of the other dependent personality variable of interest- trait EI.

1.4.2 What is trait EI?

1.4.2.1 Trait EI Defined

The term emotional intelligence (EI) has received much attention over the past several decades. The topic has generated a lot of research and has become a *hot* topic in popular culture. While the bulk of this interest is relatively new, the history of EI extends much further back to the early twentieth century. The roots of EI can be traced back to Thorndike's (1920) research on social intelligence. Thorndike focused his work on intelligence and argued that a distinct form of intelligence, known as social intelligence, exists among all individuals. He asserts that this intelligence encompasses the ability to understand and manage people and act accordingly in human relations. The notion of a social intelligence theory emphasizes the need for an intelligence to exist that is distinct from general intelligence.

Following in the same direction later came the work of both Howard Gardner and Robert Sternberg. Gardner's (1983) theory of multiple intelligences includes a total of eight intelligences. Relevant to this thesis are his theory on intrapersonal and interpersonal intelligences, as these two intelligences can be closely linked to EI. More

specifically, Gardner suggests that individuals who are high in intrapersonal intelligence are able to both detect and express his or her feelings. Individuals who are high in interpersonal intelligence are aware of the feelings and intentions or others and use this information to shape the interaction between his or herself and the individual (Gardner, 1983). Sternberg's triarchic theory (1985) of intelligence includes cognitive as well as motivational and affective functioning, providing additional support for the idea that intelligence is not purely confined to standard IQ. Both Gardner and Sternberg have contributed greatly to the fields of education and psychology alike.

Some early adopters of the term emotional intelligence include Leuner (1966), Payne (1986) and Greenspan (1989) and exploration into this topic continued with the work of Salovey and Mayer (1990). The theory put forward by Salovey and Mayer defines EI as a composition of four related abilities that include emotion management, understanding, perception and facilitation (Mayer & Salovey, 1997). While Salovey and Mayer were among the first to conceptualize EI, it was Daniel Goleman's (1995) popular book, *Emotional Intelligence* that catapulted the term into mainstream popular culture. At the crux of Goleman's theory is the application of EI in real world scenarios. He claims that high EI is advantageous in all aspects of life including organizational behaviour, relationships and the work place. For these reasons, the concept gained recognition in the press and generated a lot of interest amongst the public, particularly in business environments. However, there is little empirical evidence to support Goleman's claims and many have questioned the usefulness of EI and wondered how it was distinct from other previously established constructs (Ciarrochi, Dean & Anderson, 2002). With the introduction of the theory in 1990 and the popularization of Goleman's book, several new theories have surfaced adding

significant support for the construct validity of EI (Bar-On, 1997; Mayer & Salovey, (1997); Schutte et al., 1998; Petrides & Furnham, 2000a). These new theories suggest there is no agreed upon definition of emotional intelligence, but they have however shown that the research has generated much discussion and literature on the topic.

The significance of EI is a source of debate amongst researchers, more specifically how it stands alone as a distinct and important construct from standard intelligence. Goleman (1995), Sternberg (1996) and Gardner (1983) all claim that a form of intelligence, such as EI, distinct from cognitive abilities, may account for aspects of personality development that lies outside the sphere of standard IQ. One example of this lies in job performance as several studies have indicated that IQ is not a strong predictor of job performance (Cherniss, 2000; Hunter & Hunter (1984); Sternberg, 1996). According to Sternberg (1996), IQ may count for as little as 10% of the variance in job performance. With this kind of evidence, it's only logical to question what variable is responsible for performing well at the workplace. Goleman (1996) believes that social and emotional abilities account for much of personal success and that emotional intelligence is more important than IQ. While much of the research discussed above focuses on EI defined as an ability rather than as a personality trait in order to highlight the difference between the two definitions, going forward this thesis will focus primarily around trait EI.

1.4.2.2 The Sampling Domain of trait EI

This thesis will define trait EI as a constellation of emotional self-perceptions located at the lower levels of personality hierarchies (Petrides, Pita & Kokkinaki, 2007). This construct concerns an individual's perceptions of his or her own emotions and the emotions of others. Trait emotional self-efficacy is an alternative label to describe the

trait EI construct (Petrides, 2011). According to Petrides:

> Trait EI is the only operational definition in the field that recognizes the inherent subjectivity of emotional experience. That the trait EI facets are personality traits, as opposed to competencies or mental abilities or facilitators, is also corroborated by research revealing that the same genes that are implicated in the development of individual differences in the Big Five personality traits are also implicated in the development of individual differences in trait EI [Vernon, Villani, Schermer, & Petrides, 2008, (2010, p. 138)].

Trait EI is made up of four broad factors and 15 facets based on the content analysis of existing literature on EI including the work of Bar-On (1997), Goleman (1995) and Salovey and Mayer (1990) (Petrides & Furnham, 2001). The sampling domain is argued to be the most comprehensive inventory of trait EI to date (Petrides and Furnham, 2001). Table 1.3 illustrates the 15 subscales of the TEIQue that make up trait EI as stated by Petrides (2009).

Table 1.3
The sampling domain of trait EI (Petrides, 2010)

Facets	Brief description	High scorers view themselves as…
Adaptability	Concerns an one's flexibility in their approach to work and life	…flexible and willing to adapt to new situations
Assertiveness	Concerns how forthright an individual is with individuals and in situations	…forthright and willing to stand up for their rights
Emotion expression	Concerns an individual's fluency in expressing and communicating emotions to others	…capable of communicating their feelings to others. Express their feelings accurately and willingly.
Emotion management (others)	Concerns one's perceived ability to manage other people's emotional states.	…capable of influencing and managing other people's feelings and emotional expressions.

Emotion perception (self and others)	Concerns one's perceptions of their own emotions as well as in others	…clear about what they feels and able to decode other people's feelings
Emotion regulation	Concerns one's control of their own feelings and emotional states	…having control over their own feelings and able to change unpleasant moods through personal insight and effort.
Impulsiveness (low)	Concerns one's perceptions of how they can control themselves. This scale measures dysfunctional rather than functional impulsivity	…careful decision makers who weigh all the information they have before acting upon it.
Relationships	Concerns one's personal relationships. This includes close friends, family, and partners	….capable of sustaining meaningful personal relationships.
Self-esteem	Concerns one's overall evaluation of oneself.	…successful and full of confidence.
Self-motivation	Concerns one's perception of their drive and motivation.	…driven and likely to see something through rather than give up when it gets difficult.
Social awareness	Concerns one's perceptions of their social skills and networking potential.	…possessing great social skills and accomplished in networking.
Stress management	Concern's one's perceptions of their coping mechanisms and how they handle pressure.	…capable of handling pressured situations and regulating stress.
Trait empathy	Concerns one's perceptions on how they understand another's needs and desires and take on their point of view.	…capable of taking on someone’s perspective and putting themselves in their shoes.
Trait happiness	Concerns pleasant emotional states occurring in the present.	…cheerful and satisfied with their life.
Trait optimism	Concerns positive outlooks to life situations and the future.	…confident and likely to expect positive outcomes in their life.

In addition to the 15 facets, there are four broad factors of trait EI. These factors include: Well-being, Self-control, Emotionality and Sociability. A brief description of these factors is presented below.

1.4.2.2.1 Well-being

Individuals who score high in this factor display overall feelings of happiness, fulfilment and positive attitudes in their past achievements and future expectations. Conversely, individuals who score low on this factor may hold low self-regard and disappointment concerning their current life situation. Scores in this factor are largely dependent on an individual's score on the corresponding three broad factors.

1.4.2.2.2 Self-Control

Scores on this factor relate to an individual's level of impulsivity. For example, people who score high on the self-control scale are less likely to engage in impulsive behaviour and are more likely to be able to regulate external pressures and stress. On the other hand, those individuals who score low on this trait are more likely to engage in impulsive behaviour and are also less able to manage external pressures. These individuals may also display inflexible thinking and behaviour.

1.4.2.2.3 Emotionality

The emotionality factor refers to the expressions and perceptions of trait EI. High scores in this factor are equated with a large number of emotion-related skills including the ability to perceive and express emotions in close relationships. As would be expected, individuals who score low on this factor find it difficult to internalize and express their emotions to others. Conversely, high scoring individuals have less trouble internalizing and expressing their emotions. Low scoring individuals may find themselves in less satisfying close relationships as opposed to their high emotionality

counterparts.

1.4.2.2.4 Sociability

The fourth factor, sociability, is closely linked with social influence and social relationships. Unlike the emotionality factor, which emphasizes close personal relationships, this facet focuses on social interaction as a whole. High scores on this factor are associated with individuals having good listening and communication skills. These individuals tend to be able to communicate clearly and confidently while low scoring individuals do so with difficulty.

1.4.2.3 Applications of Trait EI

When evaluating a construct one must assess how it contributes to real world applications. Significant research has been done on the construct validity of trait EI and applications are found in the realms of organizational, clinical and health psychology as well as in educational and social settings.

1.4.2.3.1 Organizational

There is little support for the ways in which personality measures predict job performance (Murphy & Dzieweczynski, 2005). However, recent studies have found that high trait EI is correlated with higher levels of perceived job control, job satisfaction and job commitment as well as lower levels of stress (Petrides & Furnham, 2006; Platsidou, 2010; Singh & Woods, 2008). Mikolajczak, Menil, and Luminet (2007) found that individuals with high trait EI scores experienced lower levels of burnout in their job and had less somatic complaints. The researchers also found that individuals scoring high on trait EI performed less emotional effort and experienced more positive consonance (Mikolajczak et al., 2007). They believe this is a result of these individuals experiencing more positive emotions and displaying more empathy

when confronted with difficult situations. In a study examining the relationship between trait EI and nursing team performance and cohesiveness, Quoidbach and Hansenne (2009) found that health care quality and group cohesiveness were both correlated with the facet emotion regulation. As described in Table 1.3, this facet concerns one's control of his or her feelings and emotional states. This factor is important in maintaining positive group cohesiveness. The ways in which trait EI can predict job performance is of great interest and requires more research (Petrides, 2011).

1.4.2.3.2 Clinical & Health

A number of studies have linked trait EI to both physical and psychological health (Petrides, 2011). In regards to clinical applications, trait EI scores are negatively related to personality disorders and can be indicators of psychopathology (Leible & Snell, 2004; Malterer, Glass, & Newman, 2008; Watson, 2000). In a study of adolescents, Mikolajczak, Petrides and Hurry (2009) investigated the role of trait EI in self-harm. They found that trait EI was positively correlated with coping strategies and negatively correlated with maladaptive coping strategies and depression. Their overall conclusions were that the relationship between trait EI and self-harm was mediated by the choice of coping strategies.

In another adolescent study, Mavroveli, Petrides, Reiffe and Bakker (2007) examined the relationship between trait EI and psychological well being. The researchers found that in a sample of adolescents, trait EI related negatively to depression, somatic complaints and maladaptive coping styles. Findings also suggest that trait EI related positively to peer-related social competence and adaptive coping styles (Mavroveli et al, 2007). Adolescents who perceive themselves as knowing and regulating their own emotions reported less depression and physical pain than the other

participants in the study. Additionally, when compared to low trait EI participants, adolescents with high trait EI scores seem to be less vulnerable to psychological disorders (Mavroveli et al., 2007). These findings are fitting as Furnham and Petrides (2003) found trait EI positively correlates with happiness.

Andrei and Petrides (2013) study found further evidence to support the strong link between trait EI and mental health. Their results showed that individuals with high trait EI scores have lower levels of negative affect and somatic complaints. More specifically, "high trait EI individuals are more likely to experience positive moods and less likely to experience negative moods" (Andrei & Petrides, 2013, p.10). They suggest that further research into the origins of somatic symptoms be examined in order to understand the transactional model of stress and coping (Andrei & Petrides, 2013).

In addition to mental health, trait EI is also linked to developmental disorders such as Asperger syndrome. This developmental disorder is characterised by deficits in social interaction, communication skills as well as behavioural inflexibility (Wing, 1996). Petrides, Hurdy, Michalaria, Swami and Sevdalis (2011) found that individuals with Asperger syndrome scored significantly lower on 12 of the 15 TEIQue facets, all four factors and global trait EI than the control group. This finding was in accordance with the researchers hypothesis as Asperger syndrome is characterized by deficits in some of the very facets that comprise trait EI, such as social awareness, emotion perception, and emotion expression. The relationship found between trait EI and Asperger syndrome is an important step in understanding how the symptoms of this developmental disorder fit within the natural individual variability seen in the broad population. (Petrides et al., 2011).

1.4.2.3.3 Educational

The role of trait EI in academic settings is a topic of interest in a number of studies (Ciarrochi, Deane, & Anderson, 2002; Petrides & Furnham, 2003; Petrides, Frederickson, & Furnham, 2004). Petrides et al., (2004) explored the relationship between trait EI and behaviour in a study of British secondary school adolescents. They found that trait EI scores correlated with behaviour in schools. More specifically, their study found that students with high trait EI scores had fewer unauthorized absences and were less likely to be excluded from school (Petrides et al., 2004).

1.4.2.3.4 Social

Trait EI is correlated with social behaviours in schools (Mavroveli et al., 2007; Petrides, Sangareau, Furnham, & Frederickson, 2006). In a study on peer relations in a primary school, high trait EI pupils scored higher on pro-social factors and lower on anti-social factors in school (Petrides, et al., 2006). The high trait EI pupils also were nominated as being cooperative by their classmates and were less likely to receive nominations for disruptive and aggressive behaviours.

Other social applications of trait EI lie in relationship communication and satisfaction. Smith, Heaven, & Ciarrochi (2008) explored the relationship between these variables in a sample of 82 couples. They found that the most satisfied couples were the ones who did not avoid communication when it came to relationship problems. The most satisfied couples also rated their partners as high in trait EI and perceive themselves as having similar levels of trait EI to their partner (Smith et al., 2008). All of the ways in which trait EI can be applied to real-world scenarios adds to the construct validity of the theory. The validity and other psychometric properties of the trait are discussed in more detail in Section 1.4.2.4 in a detailed discussion of the measurement

of trait EI.

1.4.2.4 Measuring Trait EI

Like other personality measures (Cattell & Mead, 2008; NEO-PIR, McCrae & Costa, 1992), trait EI is assessed via a self-report questionnaire that asks participants to report their self-perceptions on a Likert scale. The Likert scale indicates the to degree to which one agrees or disagrees with an item on the measure. Types of items may include items such as *I know what others are feeling just by looking at them* (Petrides & Furnham, 2000b). Two scales will be used throughout this thesis to assess trait EI, the Trait Emotional Intelligence Questionnaire (TEIQue; Petrides, 2009; see also Cooper & Petrides, 2010) and the abridged version the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF; Petrides, 20009).

The TEIQue-SF (Petrides, 2009) was adapted on the foundation of the long version of the TEIQue (Petrides, 2009; see also Cooper & Petrides, 2010). Like the TEIQue, the short form is a self-report measure that consists of items that are to be marked on a 7-point Likert scale. This version has shown to have highly reliable global trait EI scores for both males (α=89) and females (α=.92; Petrides, 2006). The measure also has good internal consistency (α=..88, N=1119; Petrides, 2006) and has demonstrated to have significant correlations with a wide range of variables including dysfunctional attitudes and mental health disorders (Perez, Petrides & Furnham, 2005). These correlations include personality disorders, coping styles, life satisfaction, perceived job control, job satisfaction (Petrides et al., 2003), and happiness (Furnham & Petrides, 2003). Unlike the TEIQue, the short form generates only a global score of trait EI while the long form measures 15 subscales of trait EI displayed in Table 1.2 as well as the four broader concepts.

While there are other measures of trait EI circulating (Emotional Quotient Inventory, Bar-On, 1997; Schutte Emotional Intelligence Scale, Schutte et al., 1998), Cooper and Petrides (2010) highlight three advantages the TEIQue has over the others. Firstly, the TEIQue is founded upon a psychological theory that incorporates the construct into mainstream models of differential psychology (Cooper & Petrides, 2010). Secondly, this scale assesses and yields scores for the global trait as well as the four factors and 15 facets. And lastly, the TEIQue continues to display very good psychometric properties as discussed above.

1.5 Analytic and Methodological Tools

This thesis focuses on quantitative studies and all of the data in the experimental designs is measured via a wide range of analytic tools. The meta-analyses carried out in Chapter 3 use a very different set of analyses than the other statistical techniques later in the thesis. Methods such as measuring weighted effect sizes, analysis of variance and repeated measures analysis of variance will all be employed.

1.6 Overview of Thesis

This thesis will attempt to meet the aims as stated in Section 1.3, through a framework of seven consecutive interrelated chapters. While each chapter has its own set of questions it also builds upon the one before it and provides a base for each chapter that follows. The sequence of the chapters is as follows: the next chapter presents a review and discussion of previous research conducted on birth order and personality; Chapter 3 extends the review of previous literature by conducting a series of meta-analyses in order to systematically review past studies that examined the relationship

between birth order and personality.

The first experimental design is introduced in Chapter 4. This between family design examines the relationship between birth order and the Big Five and trait EI respectively in two consecutive studies. Each study assesses the variables through self-report questionnaires in large sample sizes so that each birth order group can be examined separately. Chapter 5 presents a more in-depth look at the relationship between birth order and trait EI. This between family study utilises the TEIQue, a longer more comprehensive measure of trait EI than was used in Chapter 4. The aim of using this measure was to understand potential birth order effects on trait EI and all of its facets in addition to providing further evidence of the findings in Chapter 4.

In Chapter 6, both the Big Five and trait EI are assessed using similar measures as Chapter 4, however the design of the study differs. Unlike the previous two chapters, Chapter 6 uses a within family design. This study consists of sets of full biological siblings all from three-sibling sibships. Chapter 7 summarizes and incorporates all of the findings throughout the thesis and concludes with the contributions made as well as a look at the directions in which birth order research could head next.

Chapter 2: Critical Review of the Literature[1]

2.1 Introduction

The topic of birth order continues to be a popular topic of conversation and a topic that the media can never seem to get enough of. Newspaper headlines and magazine covers can be found on a regular basis spewing information on birth order and leadership, IQ or sibling relationships in general. The popularity of these articles are two-fold; firstly, there is a mass appeal as it is a topic that everyone can relate to and secondly there are the parents who are looking for the answers on how to maximize their child's birth order. These parents often are looking for the ideal age range between siblings, how to prevent their child from *middle child syndrome*, and how to help their only child not fall into the stereotypes to which they are associated with.

This interest in birth order extends far beyond mainstream media, as researchers have examined the relationship between birth order and a variety variables such as intelligence (Kanazawa, 2012; Zajonc, 1976; Zajonc, 2001), food allergies (Kusunoki, et al., 2012), goal preferences (Carette, Anseel, & Van Yperen, 2011), parental favoritism (Salmon, Shackelford, & Michalski, 2012) and trust (Couritol, Raymond, & Faurie, 2009), just to name a few. As indicated, the types of variables linked to birth order are quite diverse and suggest that birth order is a topic worthy of examining. This thesis will focus on the relationship between birth order and personality and begin with a review of existing literature.

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[1] Parts of this literature review have been published in Cole, E. & Petrides, K.V. (2010). Birth order effects on extraversion. In A.M. Columbus (Eds.), *Advances in Psychology Research* (Vol 65; pp. 339-346). New York: Nova Science Publishers.

2.2 Birth Order

A discussion of sibling rivalry can be traced back to Cain and Abel, and theories about how the order of siblings affects an individual have been developing over centuries. The order in which an individual is born in relation to his or her siblings (e.g., only child, first, middle, youngest), known as birth order, is said to have an influence on an individual's characteristics. As far back as Darwin (1859), sibling rivalry and individual differences between siblings have been of interest to researchers. Darwin suggested that differences amongst siblings are a result of survival mechanisms and first borns tend to be stronger and bigger leading them to have a greater reproductive value to their parents (Sulloway, 1995). According to evolutionary psychology, sibling rivalry is Darwinian logic and part of the survival of the fittest meaning that siblings compete against each other in order to survive in their family ecosystem.

Ideas of birth order influences resurfaced when Galton (1874) claimed that many leading scientists were first borns though it was the work of psychologist Alfred Adler who introduced the importance of family constellation on a child's personality (Ansbacher & Ansbacher, 1956). Adler (1927, 1928, 1958) suggested that birth order is a major component of the family constellation and his interests focused on firstborns, secondborns and last borns. According to Adler, the first-born child suffers a trauma when the second is born as he is displaced as the one and only. The first born no longer receives all of his or her parents attention. This feeling of dethronement leads the first born child to strive for achievement and affiliation while also holding needs of dependency (Gates, Lineberger, Crockett & Hubbard, 1988). The second born comes into the family never knowing the feeling of being the only

child and therefore holds a more advantageous position and likely to be more psychologically adjusted. The last borns receive the most attention as they not only are unaware of the attention that a first born receives before other children enter the sibship, but also receive attention from their siblings which in turn can lead to feelings of egocentrism (Ansbacher & Ansbacher, 1956). However, Adler asserts that it is not the ordinal position of a child's birth order, but rather their psychological position. The psychological position refers to the role the child adopts in relation to others in his or her family constellations (Eckstein, Aycock, Sperber, McDonald, Wiesner, Watts, & Ginsburg, 2010).

Birth order theories continued to generate interest amongst both researchers and the public with the publication of *Birth-order: Its influence on personality* (Ernst & Angst, 1983) and Frank Sulloway's *Born to Rebel* (1996). It was Sulloway's book that jolted the topic of birth order into both popular psychology and empirical research.

2.2.1 Behavioural Genetics of Personality and Birth Order

It is commonly accepted that personality is affected by a combination of environmental and genetic influences (Beer & Horn, 2000; Jang, Livesley & Vernon, 1996; Pike & Plomin, 1997). It is this combination of variables that makes siblings within the same family different from one another (Plomin & Daniels, 1987). Research on sibling sets (twins and non-twins) reared together and reared apart have found that approximately 40% of the total variance in personality is genetic (Sulloway, 2007). Thus, when considering sibling relationships it is necessary to take into account genetic influences as well as two types of environmental influences: shared and non-shared. A shared environment refers to the environmental influences, such as growing up in the same home, which make siblings similar (Borkenau, Riemann, Angleitner, & Spinath,

2001). A non-shared environment, on the other hand, refers to the differences in the environment between the siblings, and birth order is a prime example of this. While siblings will share a home and most likely their toys, what they do not share (with the exception of multiples) is their place in the family, e.g., youngest child versus oldest child.

The difference in sibling position and the impact it has on an individual's personality remains a topic of debate and results in empirical research are varied. While many studies have found no evidence of birth order effects (Beer & Horn, 2000; Bouchard & McGue, 1990; Ernst & Angst, 1983; Michalski & Shackelford, 2002; Plomin & Daniels, 1987; Schooler, 1972) others have found differences in both intelligence (Zajonc, 2001) and personality (Beck, Burnet & Vosper, 2006; Dixon, Reyes, Leppert & Pappas, 2008; Paulhus, Trapnell & Chen, 1999; Sulloway, 1996). However, birth order effects may be contributed to a number of confounding variables as discussed in the following section.

2.2.2 Birth-Order Effects: Contributing Factors

Sulloway (1996, 2001a) suggested that birth order effects in personality and behaviour can be explained by a family dynamics model comprising several causal mechanisms. These mechanisms include differences in parental investment, competition due to dominance hierarchy effects such as age, sex and power, as well as niche partitioning within the family and deidentification (Sulloway, 2007). The idea of parental investment is tied to socio-economic factors. When a family is faced with low financial resources, Sulloway suggested that parental focus is shifted to one child and that is usually the first born. However, in an effort to improve or secure their position in the family, later borns may need to be more extraverted. By being extraverted, later

borns may be able to gain parental attention and additionally assert themselves to their older siblings (Sulloway, 1996). In this way, later borns increase parental investment emotionally as well as gain attention within the family structure and amongst their siblings.

Competition amongst siblings for power, attention, and personal gain is a result of the natural hierarchy that forms when a new sibling comes into the picture. With the exception of only children, there will always be one sibling older, stronger and bigger, in most cases, and for most of childhood this is the first born. As Sulloway states:

> Even if parents do not favour one child over another, sibling rivalry influences the dynamics of family life because competition serves to limit favouritism. Such competition typically involves the cultivation of family niches that correspond to differences in birth order (1999, p. 190).

According to Sulloway (2007), this mechanism is associated with the dominance facet within extraversion. First borns grow up being more assertive and dominant leading them to score higher on those facets of the trai.

Another mechanism discussed by Sulloway (1996) is de-identification. Siblings use different strategies to solicit parental investment; while first borns display beliefs and personality traits that mirror their parents, later borns differentiate themselves by doing the opposite (Sulloway 1996, 2001). An example is a first born who shows a keen interest in classical music, like his or her parents, while the later born dislikes classical music and prefers rock and roll. This type of de-identifying enables the later born to solicit a different type of attention and investment from his or her parents and is another reason why later borns are said to be more rebellious (Sulloway, 1996).

Past difficulties in ascertaining the relationship between birth order and

personality can be attributed to a number of variables that need to be filtered out in order to properly assess birth order effects (Dixon et al. 2008). These variables include SES, cultural background, gender, and age spacing between siblings. According to Dixon et al., "further investigation of SES and how it impacts the personalities of siblings is necessary, specifically as it relates to the biology of individuals and its consequent impact on personality" (2008, p.127). Large families are more likely to be associated with a lower than average SES (Michalski & Shackelford, 2002). The challenges that children in these families face may be the cause of individual differences in personality, rather than the birth order effects themselves. Conversely, the ability to easily afford many children and provide a greater distribution of resources may have its own effect on personality.

Other conflicting findings in birth order research can also be attributed to methodological issues (Beck et al. 2006; Dixon et al., 2008). Many birth order studies have used a between-family design, where first borns from different types of families are compared, and researchers are left to filter out all extraneous variables. These variables include socio-economic status (SES), sex, age, age spacing, which refers to the number of years between siblings and sibship size, which refers to the number of siblings in a family. Age spacing needs to be taken into account, as two siblings raised 18 months apart are growing up in a much more similar environment than two siblings reared nine years apart. In fact, siblings seven or more years apart often grow up feeling like only children because they spend a majority of their time without their sibling in the house. According to Zajonc (1976) the failure to take age spacing into account has led to inconsistent findings in the birth order literature. Sibship size also must be considered in birth order research, since for example; the eldest sibling of two

potentially has very different resources than the eldest of six. Relative to their first born siblings, later borns are part of larger sibship sizes for a longer duration of time and are often raised in lower SES environments (Michalski & Shackelford, 2002), which is why such variables must be accounted for in future research. Sulloway's theory on the relationship between birth order and personality provides the framework from which many of the hypotheses present throughout this thesis are based.

2.2.3 Stereotypes about Birth Order

With the circulation of birth order research into mainstream society, individuals have developed beliefs about birth order differences in personality. People often describe themselves or others with reference to their birth order; for example, the term *middle child syndrome* is often used to describe those who feel unnoticed or lost in their family and seek attention. Terms such as this often come up in the media and are used with little empirical evidence to back them up. Herrera, Zajonc, Wieczorkowska and Cichomski (2003) found a relationship between birth order beliefs and their reflection in reality. More specifically, they found that occupations believed to be held by certain birth ranks (e.g., first borns: doctors and lawyers; later borns: artists and actors) were consistent with personality traits attributed to these professions. First borns are believed to be more intelligent and possess personality traits such as responsibility and stability that are commonly known to be associated with doctors and lawyers, whereas later borns are believed to be more creative and extraverted, traits that are associated with actors and artists. The question stemming from of this research is how much of an influence these birth order beliefs have on an individual's personality and behaviour? According to Herrera et al.:

It is entirely possible that people's beliefs about birth rank differences may

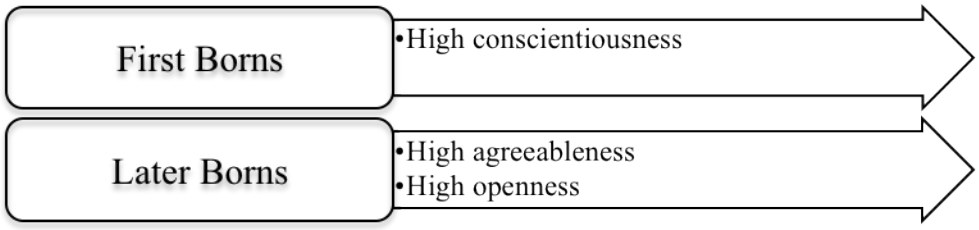
> induce differences in parents' expectations for their own children and about other people in general. They may also induce differences in the attributions about their children's abilities and behaviour. As a result, people may react differently to first born and later born children and may 'differentially reinforce and shape child behavior that fits within these stereotypes' (Baskett, 1985, p. 444). That behavior, in turn, might strengthen their beliefs (2003, p. 143).

While it is nearly impossible to control for parental influence on birth order differences, it is an important variable to consider. This chapter now shifts focus to existing research on the relationship between birth order and personality.

2.3 A review of birth order literature and the Big Five

This section reviews Sulloway's predictions on the relationship between birth order and the Big Five. A more detailed description of the Five Factor model can be found in Section 1.4.1 Sulloway (1996) generated hypotheses regarding the relationship between birth order and several of the Big Five personality dimensions as displayed in Figure 2.1. His findings were not based on his own empirical research but rather a review of previous research and his own theories on evolutionary psychology. Systematic reviews of previous work in conjunction with his work on Darwinian finches generated theories so intriguing they generated a breadth of interest in the academic community and inspired the work of many studies including the ones in this current thesis.

Figure 2.1
Sulloway's theory on birth order effects on personality



While Sulloway (1996) found neuroticism and extraversion difficult to make definitive claims regarding their respective relationships with birth order, he did develop theories on the other three traits. These will be discussed throughout the remainder of the Chapter in relationship to relevant literature.

He asserted that later borns are more likely to question authority and take risks in an attempt to seek parental attention.

2.3.1 Birth order and Neuroticism

For neuroticism, Sulloway (2001a) predicts mixed outcomes: while first borns are more anxious, vulnerable and prone to depression, later borns are more self-conscious. Therefore, while later borns may score lower on the anxiety facet, they may score higher on self-consciousness, which would lead to similar global scores on neuroticism. Thus the relationship between birth order and neuroticism has remained inconclusive, at least at the global level of the trait (Buunk, 1997; Dixon et al., 2008; Jefferson, Herbst, & McCrae, 1998; Marini & Kurtz, 2011; Paulhus et al., 1999). These studies suggest varying alternatives as to why they did not find results to support Sulloway's hypothesis. Jefferson et al. (1998) suggest that while self-report measures are very good predictors of personality traits the "…failure to find birth-order effects in conventional self-reports must be taken seriously" (p.507), however they do not present

an alternative method or a suggestion to use peer ratings as some other studies have done (Healey & Ellis, 2007; Marini & Kurtz, 2011). According to Paulhus et al. (1999), peer ratings tend to fall in the direction of Sulloway's hypotheses, however self-ratings and spousal ratings do not.

2.3.2 Birth order and Extraversion

Much like neuroticism, the difficulty Sulloway (1995) had with making a definitive claim on the relationship between birth order and extraversion is due to the individual facets comprising this trait. Extraversion is made up of six facets, including: warmth, gregariousness, assertiveness, activity level, excitement-seeking and positive emotions as described in Table 1.1. While one facet, gregariousness, often referred to as sociability, would lead Sulloway (2001b) to conclude that later borns are more out-going and excitement seeking and therefore more extraverted, another, assertiveness, seemed to best describe the older borns. Therefore, a later born may score higher on sociability and lower on dominance, which would yield a moderate score on total extraversion. These different facets therefore make it very difficult to generalize on the relationship between birth order and this trait.

Research by Dixon et al. (2008) investigated birth order effects on personality in large families (≥6 siblings). A combination of between and within family designs was used in a sample of large families from similar backgrounds (e.g., same ethnicity and similar SES). This study found gender and sibship size had no effect on personality, while birth order had a significant effect on extraversion, with later borns scoring higher than their older siblings. Dixon et al. (2008) asserted that this birth order effect on extraversion was found because of the within family design and that this is the most effective way to estimate the relationship between the variables. In other words, when

investigating sets of siblings rather than individuals in general, birth order effects become apparent. The researchers argued that this is an important finding, especially because their results contradicted previous literature, which found no support for this effect (Bouchard & McGue, 1990; Ernst & Angst, 1983; Plomin & Daniels, 1987).

2.3.3 Birth order and Openness

Sulloway (1995) predicted that later borns are more likely to be open to experience than their older siblings, as this construct is related to being rebellious, unconventional and adventurous; all of which are characteristics Sulloway claimed to be associated with later borns. Townsend (2000) examined the relationship between birth order and rebelliousness and found no relationship between the variables. However, Healy's (2007) within family study found that firstborns scored lower than later borns on this trait as predicted by Sulloway. Healy (2007) asserts that these findings are in part a result of using a within family design rather than a between family design. In this way Healy (2007) was able to find support to Sulloway's (1996, 2001a) family-niche model of personality.

In Shao, Yao, Li, & Huang's (2013) study, the researchers examined personality and life satisfaction in China and found that only children and later borns are more open to experience than first borns. This study is unique in that the sample group consists of Chinese nationals in a country where only children represent a majority of the population due to national policy (Shao et al., 2013). While a significant relationship was found between birth order and openness this study has limitations including the extreme disproportion of only children to first and last borns. The authors suggest that this data may be influenced by the one-child policy and that future research should include samples before and after the policy was enacted in order to generate a more

balanced sample (Shao et al., 2013). This finding lends support to the assertion that everyone has a birth order, even only children.

2.3.4 Birth order and Agreeableness

Sulloway (1996) also claimed that later borns tend to be more agreeable than their older siblings. Later borns are physically weaker growing up and do not want to appear as a threat to the existing family model. In order to solicit their parents' attention and minimize confrontation with their siblings, later borns tend to be more agreeable e.g., flexible, selfless, and warm. This also reduces the competition amongst siblings (Sulloway, 2001a). Sulloway states:

> Firstborns can ready avail themselves of greater physical size to achieve dominance over their younger siblings. By contrast, laterborns tend to employ low-power strategies to obtain what they want. These strategies include pleading, bargaining, and, when all else fails, appealing to parents for protection and assistance (2007, p.170).

Several studies have found support for Sulloway's claims that later borns are more agreeable (Jefferson et al., 1998; Michalski & Shackelford, 2002; Sulloway, 1999). These studies are reviewed in more detail in Chapter 3 in addition to studies that did not find a relationship between birth order and agreeableness.

2.3.5 Birth order and Conscientiousness

Sulloway (1996) argued that first borns are more conscientious than their later born siblings due to first borns being more likely to want to please their parents than to take risks. This is because first borns are seeking parental approval and thus are more likely to display behaviours that reflect their parents' values. Sulloway (2001a) also asserts that first borns adopt as surrogate parents to their younger siblings, which in turn

leads them to be more conscientious.

Sulloway's hypotheses, based on a meta-analysis of previous studies, generated an abundance of research interest in birth order personality differences. Paulhus et al. (1999) conducted a series of studies to test Sulloway's (1995) hypotheses and found that first borns are more achieving and more conscientious, while later borns tend to be more rebellious and liberal. In line with Sulloway's (1995) claims, Paulhus et al. (1999) found birth order effects in openness, agreeableness and conscientiousness but not in extraversion or neuroticism. Beck et al. (2006), however, criticized the measure Paulhus et al. (1999) chose to assess personality traits, which asked participants to rank themselves and their siblings on seven variables relating to aspects of the Big Five. They argued that in future studies a psychometrically validated inventory of personality should be used.

2.4 Chapter Summary & A Look Ahead

The bulk of the literature reviewed in the present chapter presented conflicting evidence regarding the relationship between birth order and personality. While Ernst & Angst (1983) argue that birth order effects are negligible and are mostly attributed to differences in methodology, Sulloway asserts that sibling differences are a result of birth order and these differences can be attributed to evolutionary psychology. The literature reviewed provided support for both arguments. Chapter 3 delves deeper into these findings by conducting a meta-analysis of past studies that examined birth order and the Big Five.

Chapter 3: Birth Order and the Big Five: A meta-analysis

3.1 Introduction

Psychological research continues to show inconsistencies in the effects of birth order on the Big Five personality traits. Methodology is often cited as the contributing factor to the discrepancies in birth order research (Ernst & Angst, 1983). This chapter aims to take a closer look at this issue in the first meta-analysis conducted on birth order research since Sulloway (1996).

3.1.1 Frank Sulloway & Birth Order

Personality is influenced by a combination of environmental and genetic factors (Beer & Horn, 2000; Jang, Livesley & Vernon, 1996; Pike & Plomin, 1997). For a more detailed discussion of the relationship between personality and genetics please refer to Section 2.2.2. Environmental influences include a combination of shared and non-shared factors. Shared environmental factors include those influences that make siblings similar, such as growing up in the same house (Borkenau et al., 2001). A non-shared environment, on the other hand, refers to the differences in the environment between the siblings, and birth order is a prime example of this. Siblings are most often different ages and likely to be different genders, these differences between siblings lead to differences in size and strength as well as cognitive maturity. These factors lead individuals growing up in the same household to experience shared events differently.

Sulloway (1995) explains birth order effects in personality in a family dynamics model comprising several causal mechanisms. This model includes differences in parental investment, niche partitioning and deidentification as described in detail in Section 2.2.2.

Overall, Sulloway generated several key hypotheses on birth order effects on

personality. Firstly, he states that older borns score higher on conscientiousness than later borns. As discussed in more detail in Chapter 1, this is because first borns are more conforming and more likely to want to please their parents unlike later borns who strive to be different. Secondly, laterborns are more agreeable than first borns. These individuals come into the world sharing parental attention and resources with their sibling set. First borns on the other hand experience time in the house where they are likely to receive undivided attention from their parents. Thirdly, Sulloway states that later borns are more open to new experiences than first borns. Because they are less conforming (Saad, et al., 2005) they are more open to new ideas and different experiences. And lastly, Sulloway predicts that there is no significant relationship between birth order and either neuroticism or extraversion.

3.1.2 A review of Sulloway's theory on birth order effects

Sulloway's (1995) claims are based on a series of hypotheses and a meta-analysis of previous studies generating an abundance of research interest in birth order personality differences. Paulhus et al. (1999) conducted a series of studies testing the findings of Sulloway's (1995) meta-analysis and found that first borns tend to be both more achieving and more conscientious, while later borns tend to be more open to experience (e.g., rebellious and liberal). In line with Sulloway's (1995) claims, Paulhus et al. (1999) found birth order effects in openness, agreeableness and conscientiousness but not for either the extraversion and neuroticism traits. Beck et al. (2006), however, criticized the measure Paulhus et al. (1999) chose to assess the personality traits, which asked participants to rank themselves and their siblings on seven variables relating to aspects of the Big Five. They argued that a psychometrically validated inventory of personality would be necessary in future research.

It has been argued that the conflicting findings in birth order research can often be attributed to methodological issues (Beck et al. 2006; Dixon et al., 2008). Many birth order studies have used a between-family design, where first borns from different families are compared, and researchers are left to filter out all extraneous variables. These variables include socio-economic status (SES), sex, age, sibship size and age spacing, which refer to the number of years between siblings.

3.1.3 Critiques of past meta-analyses

The extent to which ordinal position has on one's personality remains a topic of debate and results in empirical research are varied. While many studies have found no evidence of birth order effects (Beer & Horn, 2000; Bouchard & McGue, 1990; Ernst & Angst, 1983; Michalski & Shackelford, 2002; Plomin & Daniels, 1987; Schooler, 1972) others have found differences in both intelligence (Zajonc, 2001) and personality (Beck, Burnet & Vosper, 2006; Dixon, Reyes, Leppert & Pappas, 2008; Paulhus, Trapnell & Chen, 1999; Sulloway, 1996). Due to various methodological issues, Michalski and Shackelord (2002) stress the need for an up-to-date meta-analysis and that is the purpose of this Chapter.

Ernst and Angst's (1983) book, *Birth order: Its influence on Personality*, provides an in-depth discussion on birth order research. The authors of the book use the vote-counting method to analyse previous research on this topic. Vote counting is a way to systematically tabulate significant and non-significant findings (Hunter & Schmidt, 2004). The first step is to collate all studies where the data is of interest. Next, the relationships between the independent and dependent variables are tallied and placed into one of three categories (positive, negative, or non significant). If the majority of studies fall into one category, with fewer falling into the other two, that

category is declared the winning category (Light & Smith, 1971). This method led Ernst and Angst to conclude that birth order is not an environmental factor on personality. This conclusion led to controversy both in academic and mainstream cultures. Researchers who found contradictory results were not happy with the thesis of the book and mainstream media became confused by the conflicting arguments. According to Ernst (2000), at the time the book was written the researchers were unable to use meta-analysis. He asserts that it could be worthwhile to reanalyse the studies in the 1983 book using a meta-analysis in order to see if the topic of birth order effects on personality should continue to be of interest to researchers.

Each study in the following meta-analyses defines birth order as pertaining to one of two groups: first borns and later borns. After surveying the literature, it was found that the vast majority of birth order literature focuses on these two groups and does not distinguish only children or middle children into their own birth order groups. For this reason, in order to keep the artefacts consistent throughout the meta-analyses, the studies will designate birth order as either first or later borns.

The literature search for this meta-analysis found that while many studies did not report their chosen measure of personality, the NEO-PI-R was often reported and was used more than any of the other reported measures. No other meta-analysis on the relationship between birth order and personality takes the type of measurement into account and that is what makes the results in this thesis particularly noteworthy. Therefore, the studies included in the following series of meta-analyses consist of two parts. Firstly, all studies matching the inclusion criteria were analysed. Secondly, additional analyses were conducted on just those studies that utilized the NEO-PI-R. Much of the research discussed in this thesis reviews the various methodological

differences surrounding birth order research, for this reason it is necessary to assess whether or not the type of measure used has any bearing on the results of the meta-analyses.

The set of meta-analyses presented in this Chapter aim to present a follow-up study to Sulloway's (1995) meta-analysis and therefore includes only studies that were published after 1996. Additional criteria for the inclusion of studies were developed in order to keep potential confounding variables to a minimum. Firstly, excluding all studies with child or adolescent samples reduced the age range in the sample sizes. Secondly, since the meta-analyses focused on first and later borns, twin studies were also excluded. Lastly, all studies chosen for the meta-analyses included biological siblings. Therefore, studies with adopted siblings were not included. Table 3.2 summarises all of the studies used in the meta-analyses. More details regarding inclusion criteria are presented throughout the chapter and also displayed in PRISMA flow diagrams.

The hypotheses in the current chapter are based on Sulloway's theory concerning sibling strategy and parental investment (Sulloway, 1996, 2002; Hertwig, Davis & Sulloway, 2002). It is predicted that birth order will have negligible effects on both neuroticism and extraversion, small negative effects will be found in openness and agreeableness in first borns, and that there will be a medium effect size found in birth order and conscientiousness. It is hypothesized that the effects will be stronger when the analyses include only those studies that used the NEO-PI-R. Through a series of five meta-analyses, each of the Big Five personality traits is examined with respect to birth order; it is necessary that each trait is investigated in five separate statistical tests as each variable operates independently. Hypotheses are as follows:

H1: The mean weighted effect size will be very small for neuroticism scores

H2: The mean weighted effect size will be very small for extraversion scores

H3: The mean weighted effect size will be a negative small effect on openness

H4: The mean weighted effect size will be a negative small effect on agreeableness

H5: This study will reveal a medium effect size on birth order and conscientiousness.

3.2 Study 1: Birth Order and Neuroticism

Birth order studies have not produced much evidence supporting a relationship between birth order and neuroticism. Therefore, this meta-analysis predicts that the mean weighted effect size will be non significant.

3.2.1 Method

3.2.1.1 Retrieval and criteria of studies

An exhaustive literature search through the databases presented in Table 3.1 was conducted in order to attain relevant studies. The terms 'birth order' and 'neuroticism' were entered in a search with parameters that set publishing dates to 1996-2013. The search narrowed down results by filtering studies that included terms 'birth order' and 'neuroticism' in the documents abstract and/or keywords. Researchers of unpublished articles, dissertations or studies where the results were not sufficient enough to generate the necessary information for the meta-analysis were contacted to provide details to facilitate the analyses. In cases where the articles did provide adequate information to calculate Cohen's *d,* the studies were removed from the meta-analysis. All studies with non-adult samples were removed in order to adjust for a more unified mean age. Using

these search methods, seven studies were identified with relevant data. Each of the seven studies was reviewed to ascertain which method of assessment was utilized for measuring the Big Five. Figure 3.1 displays a diagram of the study selection.

A broad summary of all of the studies included in the following set of meta-analyses is presented in Table 3.2. This Table presents an overview of the types of experimental designs used in previous research as well as their overall findings. A more detailed discussion and review of these studies can be found in Chapter 2.

Table 3.1
Databases used in Meta-analysis

Annual Reviews
Australian Educational Index
British Educational Index
British Library
CogPrints via SCIRUS
ERIC
HAPI
HighWire Press
Ingenta Connect
Journals @OVID
JSTOR
MEDLINE
PEP
PILOTS
PsycBOOKS
PsycCRTIQUES
PsycEXTRA
PsycINFO
Psychiatryonline
PubMed
SAGE
Science Direct
SCOPUS
University of London Research Library Services
Web of Science
Wiley Online Library

Table 3.2
Summary of studies included in the meta-analyses

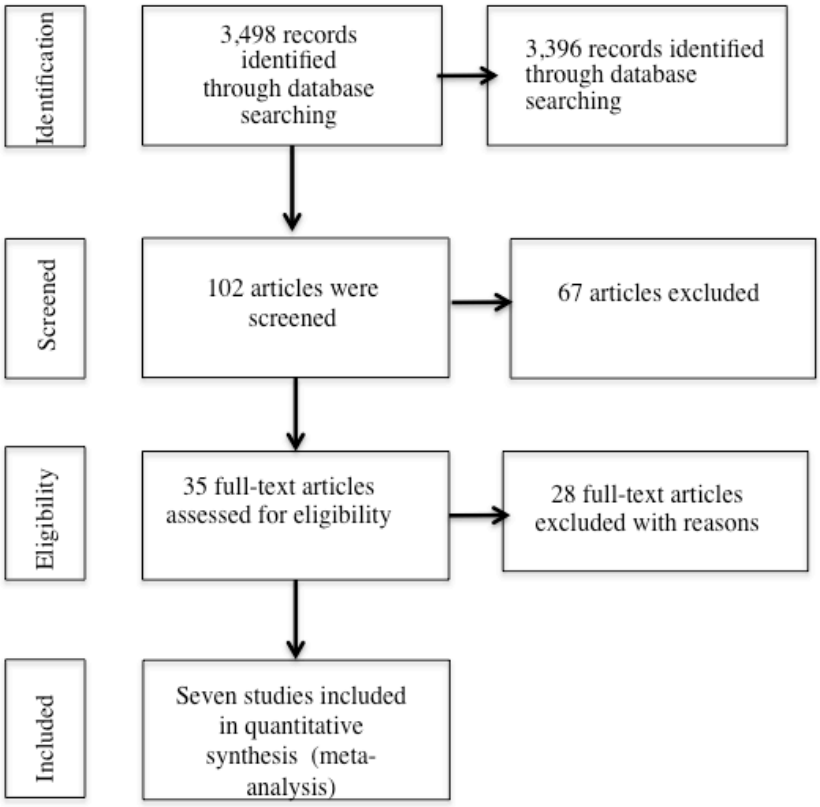
Authors (year)	Design	Study Focus	N	Sample Composition	Birth Order Groups	Findings
Badger & Reddy (2009)	Between-family design	Birth order on personality and academic sibling rivalry C	44	English speaking University students (age range 18-27)	Firstborns, Laterborns	Firstborns scored significantly higher in C than laterborns
Beck, Burnet, & Vosper (2006)	Within-family design	Birth order and E	96	UK University students (age *M*=21, *SD*=4.45)	Firstborns, Laterborns	Firstborns scored significantly higher than laterborns on the facet dominance; laterborns scored significantly higher on the facet sociability.
Buunk, B. (1997)	Between-family design	Personality, birth order and attachment styles as related to jealousy (N)	200	Dutch adults (age *M*=33)	Firstborns, Laterborns	No significant results found between birth order and personality
Gordon, J. (2012)	Between-family design	Birth order and personality (N,E,O,C,A)	122	Irish University students (age *M*=26.25, *SD*=7.5))	Oldest, Youngest, Middle, Other	No significant results found between birth order and personality
Healey, M. (2008)	Within-family	Birth order and personality (C and	203	NZ University students (age *M*=	Firstborns,Secondborns, Thirdborns	Firstborns rated higher on C and secondborns were

	design	O)		24.97)		rated higher on O
Healey & Ellis (2007)	Within-family design	Birth order, conscientious and openness to experience tests a family-niche model	161	UK University students (firstborns age *M*=25.6, *SD*=9.4; secondborns *M*=23, *SD*=9.3)	Firstborns, Laterborns	Firstborns scored significantly higher than secondborns on C. Firsborns scored significantly lower than secondborns on O.
Healey & Ellis (2007)	Within-family design	Birth order, conscientious and openness to experience tests a family-niche model	174	NZ adults (firstborns age *M*= 37.5, *SD*=10.2; secondborns *M*=35.2, *SD*=10.2)	Firstborns, Laterborns	Firstborns scored significantly higher than secondborns on C. Firsborns scored significantly lower than secondborns on O.
Jefferson, Herbst, & McCrae (1998)	Between-family design	Birth order and personality (N, E, O)	9664	US Adults (age: *M*=56,2, *SD*=14.5)	Firstborns, Laterborns	No significant results found between birth order and personality
Klein, S. (1984)	Between-family design	Birth order and personality (E)	147	US University Students (age range 17-24)	Firstborns, Middleborns, Lastborns.	Firstborns are less extraverted than middleborns and lastborns
Michalski & Shackelford (2002)	Within-family design (mixed and	Birth order and personality (N,E,O,C,A)	380	US University Students (age *M*= 26, *SD*=9)	Firstborns, Laterborns	Firstborns scored significantly lower on A than laterborns

	full genetic siblings					
Paulhus, Trapnell & Chen (1999)	Within-family design	Birth order effects on personality and achievement within families (E,O,C,A)	1,022	University Students and Adults	Firstborns, Laterborns	Firstborns scored signifcantly higher on C; laterborns scored significantly higher on O and A.
Phillips (1998)	Between-family design	Birth order and personality (N,E,O,C,A)	177	UK University students (mean age =20.3 years old)	Firstborns, Laterborns	No significant results found between birth order and personality
Saroglou & Fiasse (2003)	Between-family design	Birth order, personality and religion (N,E,O,C,A)	122	Young adults (age M =22.3)	Firstborns, Middleborns, Lastborns	First borns scored significantly higher than middleborns and middleborns scored significantly higher than last borns in C. The relationships between birth order and N, E, O, A were not significant
Sulloway (1999)	Between-family design	Birth order and personality (N,E,O,C,A)	17,779	Adult samples	Firstborns, Laterborns	Firstborns scored higher on C, Laterborns scored higher on A and O

Note: N=Neuroticism; E=Extraversion; O=Openness; C=Conscientiousness; A=Agreeableness.

Figure 3.1 PRISMA Flow Diagram of study selection for birth order and neuroticism



3.2.1.2 Computations and statistical analyses

For seven studies, Cohen's *d* for group differences was used. In some cases, *d* was calculated using means and standard deviations. In cases where means and

standard deviations were unavailable, *t* or *F* values were converted to *d*. The Hunter-Schmidt Meta-Analysis Programs Package was used to compute the average weighted effect size imputing Cohen's *d* and the sample size for each of the seven studies.

3.2.2 Results

The seven studies included produced a total N= 14,943. A complete list of the studies included in the meta-analysis is presented in Table 3.3 in addition to their corresponding sample sizes and effect sizes. The average weighted effect size for the seven studies included in this meta-analysis was -0.001 (N=14,943; Credibility Interval: 10% CV=-.10, 90%CV=1.0).

Table 3.3
Effect sizes for studies measuring birth order and neuroticism

Study	Sample	Measures	*d*
Buunk, B. (1997)	200	DPQ	0.62
Gordon, J. (2012)	122	EPI	0.25
Jefferson, Herbst, & McCrae (1998)	9664	NEO-PI-R	0.02
Michalski & Shackelford (2002)	380	NA	-0.12
Phillps (1998)	177	NEO-PI-R	0.06
Saroglou & Fiasse (2003)	122	NEO-PI-R	0.13
Sulloway (2001)	4,278	NEO-PI-R	-0.08

Note: NA= name of measure not cited by author; EPI= Eysenck Personality Indicator; NEO-PI-R= NEO Personality Inventory Revised; DPQ= Dutch Personality Inventory

The meta-analysis was then repeated using only those four studies that measured the FFM via the NEO-PI-R in order to see if the method of assessment had an impact on the average weighted effect size. The four studies using the NEO-PI-R included a total of N=14,241 participants and are included in Table 3.4. The average weighted effect size for the four studies included in this meta-analysis was -0.008 (N=14,241; Credibility Interval: 10%CV=-.052, 90%CV=.035).

Table 3.4
Effect sizes for studies measuring birth order and neuroticism using the NEO-PI-R

Study	Sample	*d*
Jefferson, Herbst & McCrae (1998)	9664	0.02
Phillips (1998)	177	0.06
Saroglou & Fiasse (2003)	122	0.13
Sulloway (1999)	4,278	-0.08

3.2.3 Discussion

As predicted, this meta-analysis found that there is a no effect size between birth order and neuroticism either in the combined studies or when the NEO-PI-R studies were analysed alone. As there were only two additional studies that used alternative instruments to measure the neuroticism, each with medium sample sizes, it is not surprising that the results were so similar. This finding is consistent in the majority of birth order literature and Sulloway asserts that this is a product of the different facets within the personality trait. He argues that individuals will score higher and lower on the different facets of neuroticism, which in turn leads to an overall moderate score on the trait.

3.3 Study 2: Birth order and Extraversion

Based on Sulloway's theory that birth order effects on extraversion are negligible due to predicted polarizing effects within the facets of trait, this meta-analysis predicts that the mean weighted effect size will be less than .20.

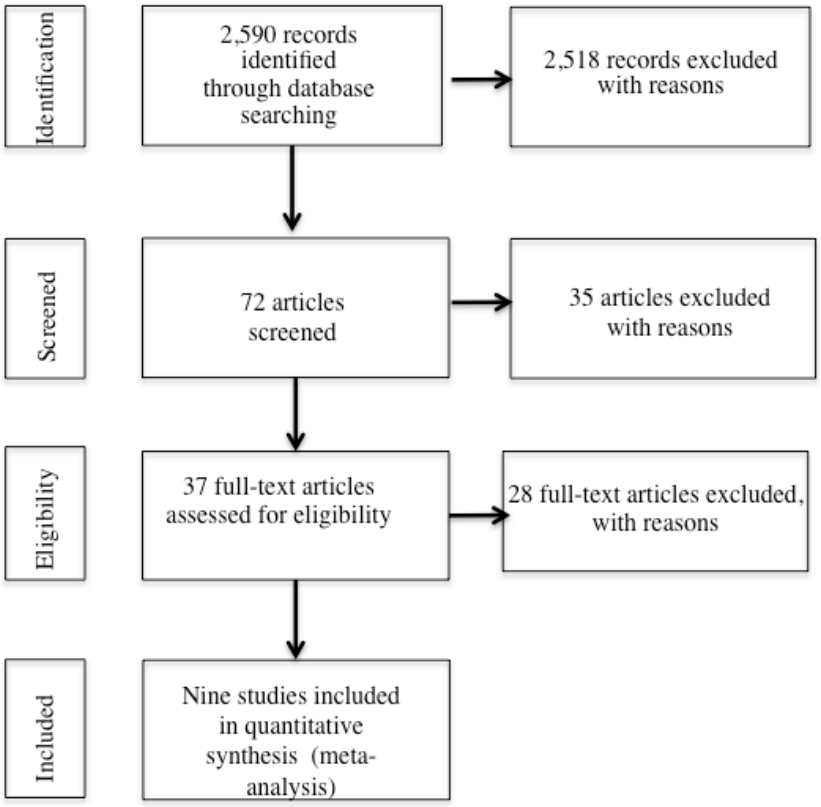
3.3.1 Method

3.3.1.1 Retrieval and criteria of studies

A literature search using the databases listed in Table 3.1 was conducted in order

to attain relevant studies. The terms 'birth order' and 'extraversion' were entered in a search with a filter to only include studies published between 1996-2013. Additional filters included searching for studies that included 'birth order' and 'extraversion' in the abstract and/or in the keywords. Researchers of unpublished articles and dissertations were contacted for more information regarding results if pertinent information concerning the results needed to generate effect sizes for this meta-analysis were missing. If there was no response from the authors, those studies were removed for lack of information. All studies with non-adult samples were removed, as were all studies with twins and adopted siblings. Using these search methods, nine items were identified with relevant data. Figure 3.2 displays the steps undertaken in the study selection.

Figure 3.2 PRISMA Flow Diagram of study selection for birth order and extraversion



3.3.1.2 Computations and statistical analyses

For nine studies, Cohen's *d* for group differences was used. In some cases, *d* was calculated using means and standard deviations. In cases where means and

standard deviations were unavailable, *t* or *F* values were converted to *d*. Additionally, in research where correlations were reported those correlations were converted to *d*. Once all of the results of the relevant meta-analysis were converted to Cohen's *d*, the effect sizes and sample of each study was entered into the meta-analysis via the Hunter-Schmidt Meta-Analysis Software Programs Package.

3.3.2 Results

The nine studies included produced a total of N=15,399 participants. A complete list of the studies included in the meta-analysis is presented in Table 3.5 in addition to their corresponding sample sizes and effect sizes. The average weighted effect size for the nine studies included in this meta-analysis was .112 (N=15,399; Credibility Interval: 10%CV=-.011, 90%CV=.24) indicating a small effect size.

Table 3.5
Effect sizes for studies measuring birth order and extraversion

Study	Sample	Measures	*d*
Beck, Burnet, & Vosper (2006)	96	NEO FFI	-0.20
Gordon, J. (2012)	122	EPI	-0.08
Jefferson, Herbst, & McCrae (1998)	9664	NEO-PI-R	0.05
Michalski & Shackelford (2002)	380	NA	-0.16
Paulhus, Trapnell & Chen (1999)	194	NA	0.02
Paulhus, Trapnell & Chen (1999)	240	NA	0.00
Phillps (1998)	177	NEO-PI-R	0.14
Saroglou & Fiasse (2003)	122	NEO-PI-R	0.28
Sulloway (1999)	4,404	NEO-PI-R	0.28

Note. NA= name of measure not cited by author; EPI= Eysenck Personality Indicator; NEO FFI= NEO Five-Factor Inventory; NEO-PI-R= NEO Five-Factor Inventory Revised; MMPI= Minnesota Multiphasic Personality Inventory.

In this study, four of the nine studies included utilized the NEO-PI-R measure. This meta-analysis was conducted once more using only the studies that used the NEO-PI-R as displayed in Table 3.5 and included a total of N=14,367 participants. The

average weighted effect size for the four studies included in this meta-analysis was .123 (N=14,367 Credibility Interval: 10%CV= -.006, 90%CV=.253) indicating a small effect size.

Table 3.6
Effect sizes for studies measuring birth order and extraversion using NEO-PI-R

Study	Sample	*d*
Jefferson, Herbst & McCrae (1998)	9664	0.05
Phillips (1998)	177	0.14
Saroglou & Fiasse (2003	122	0.28
Sulloway (1999)	4404	0.28

3.3.3 Discussion

This meta-analysis found a very small effect size between birth order and extraversion when all relevant studies are analysed together and when those studies used the NEO-PI-R to measure extraversion. Sulloway (1996) argues that the different facets within extraversion make it difficult to generalize a theory regarding the specific nature of the relationship between the two variables. As the current meta-analysis utilizes a series of studies that measure the whole extraversion trait rather than its individual facets only findings these findings are in line with Sulloway's theory.

3.4 Study 3: Birth order and Openness

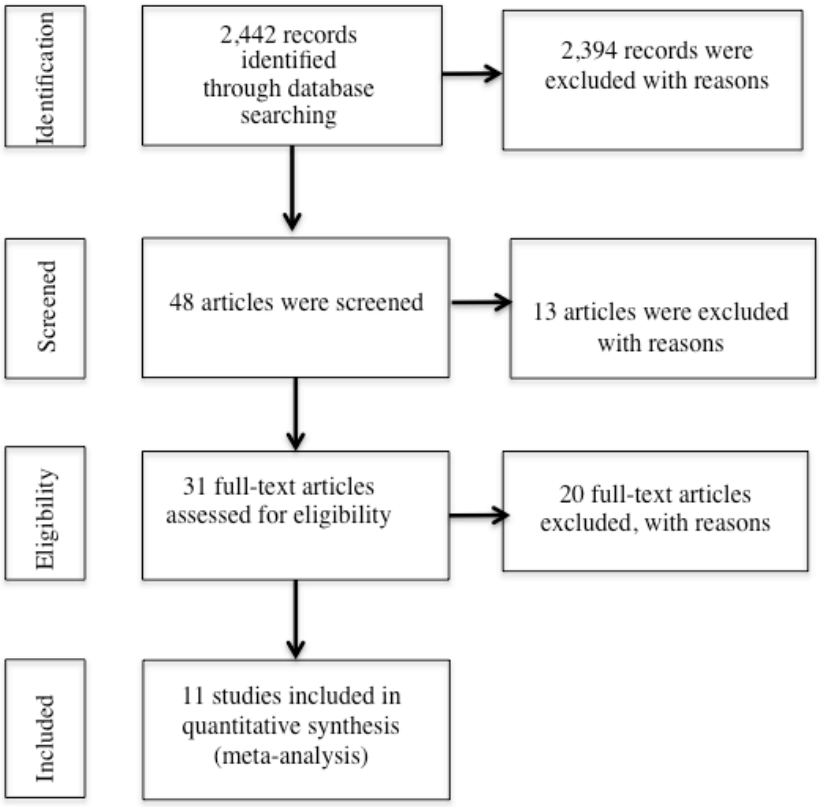
This study based its predictions on Sulloway's theory that there will be a positive relationship between birth order and openness. More specifically, as ordinal position increases, openness scores will also increase; therefore later borns will score higher on this trait than first borns and this relationship will be displayed in the following meta-analysis. Therefore this study predicts there will be a strong effect size found between birth order and openness in the eleven studies analysed.

3.4.1 Method

3.4.1.1 Retrieval and criteria of studies

A comprehensive search of literature published between 1996-2013 using key words such as ‘birth order’ and ‘openness to experience’ was conducted and used the databases listed in Table 3.1. Filtering those studies that include ‘birth order’ and ‘openness to experience’ in the abstract or keywords further refined the search. Duplicate studies were removed, as were all adoption and twin studies. as well as those consisting of child and adolescent samples. Additional studies where it was impossible to gather the necessary statistical results from either the publication or from the author were also removed. Eleven studies were chosen for this meta-analysis and the selection criteria are displayed in Figure 3.3.

Figure 3.3 PRISMA Flow Diagram of study selection for birth order and openness to experience



3.4.1.2 Computations and statistical analyses

For eleven studies, Cohen's *d* for group differences was used. In some cases, *d* was calculated using means and standard deviations. In cases where means and standard deviations were unavailable, *t* or *F* values were converted to *d* in order to generate the true mean effect size for the studies. The Hunter-Schmidt Meta-Analysis Programs Package was used to compute the average weighted effect size after imputing Cohen's *d* and the sample size for each of the eleven studies.

3.4.2 Results

The eleven studies included produced a total of N=15,829. A complete list of the studies included in the meta-analysis is presented in Table 3.7 in addition to their corresponding sample sizes and effect sizes. The average weighted effect size for the eleven studies included in this meta-analysis was .095 (N=15,829; Credibility Interval: 10%CV=-.005, 90%CV=.196). These findings suggest a very small effect size.

Table 3.7
Effect sizes for studies measuring birth order and openness

Study	Sample	Measures	*d*
Healy, M. (2008)	200	NA	0.14
Healy, M. (2008)	130	NA	0.17
Healy, M. (2008)	134	NA	0.75
Healy & Ellis (2007)	161	NA	0.39
Healy & Ellis (2007)	174	NA	0.41
Jefferson, Herbst, & McCrae (1998)	9664	NEO-PI-R	0.04
Michalski & Shackelford (2002)	380	NA	0.20
Paulhus, Trapnell & Chen (1999)	203	NA	0.10
Phillps (1998)	177	NEO-PI-R	0.12
Saroglou & Fiasse (2003)	122	NEO-PI-R	0.04
Sulloway (1999)	4,484	NEO-PI-R	0.16

Note. NA= name of measure not cited by author; NEO PI-R= NEO Personality Inventory

Of the eleven studies listed above, four of them utilized the NEO-PI-R and the meta-analysis was conducted again including these four studies consisting of a total of

14,447 participants. The studies included in this analysis are presented in Table 3.8. The average weighted effect size for the eleven studies in this meta-analysis was .078 (N=14,447; Credibility Interval: 10%CV=.021, 90%CV=.135). These results indicate a very small effect size.

Table 3.8
Effect sizes for studies measuring birth order and openness using NEO-PI-R

Study	Sample	*d*
Jefferson, Herbst & McCrae (1998)	9664	0.04
Phillips (1998)	177	0.12
Saroglou & Fiasse (2003	122	0.04
Sulloway (1999)	4484	0.16

3.4.3 Discussion

This study found a very small effect size between birth order and openness in both the analysis of all studies used and all studies using only the NEO-PI-R. It is thought that later borns are less conforming and would therefore be more open to new experiences than their older born siblings. Sulloway (1996) bases his theory regarding the relationship between birth order and openness on this hypothesis. Saad Gill and Nataraajan's (2005) study found evidence supporting Sulloway's claims. They found that later borns were more accepting and supportive of radical scientific innovation while first borns were more conforming to the *status quo*. Saad et al.'s (2005) research is based on the same Darwinian logic that Sulloway uses asserting that birth order effects are a result of a child's proactive behaviours seeking to maximize the amount of parental investment bestowed upon them.

However, leadership is a quality associated with first borns, in fact, more world leaders were the first born in their sibships (Hudson, 1990). One can then question if world leaders would need to be open to new experiences in order to gain that position

and be successful. For example, intellectual curiosity is one facet within the openness trait and world leaders would likely score high on this facet. Other facets of the trait include artistic interests and willingness to experiment; these characteristics fall into the nonconforming traits of the later born. Birth order effects on openness could therefore be difficult to identify, similar to extraversion, due to the components that make up the trait. As this meta-analysis included studies that focused on the trait as a whole, not the individual facets, the findings could be a result of the definition of openness.

3.5 Study 4: Birth order and Agreeableness

Previous research, including Sulloway (1995), suggests that later borns are more agreeable than first borns. This study predicts that the findings from the following meta-analysis will provide support for this theory and that there will be a medium effect size found in the meta-analysis of previous studies investigating birth order and agreeableness.

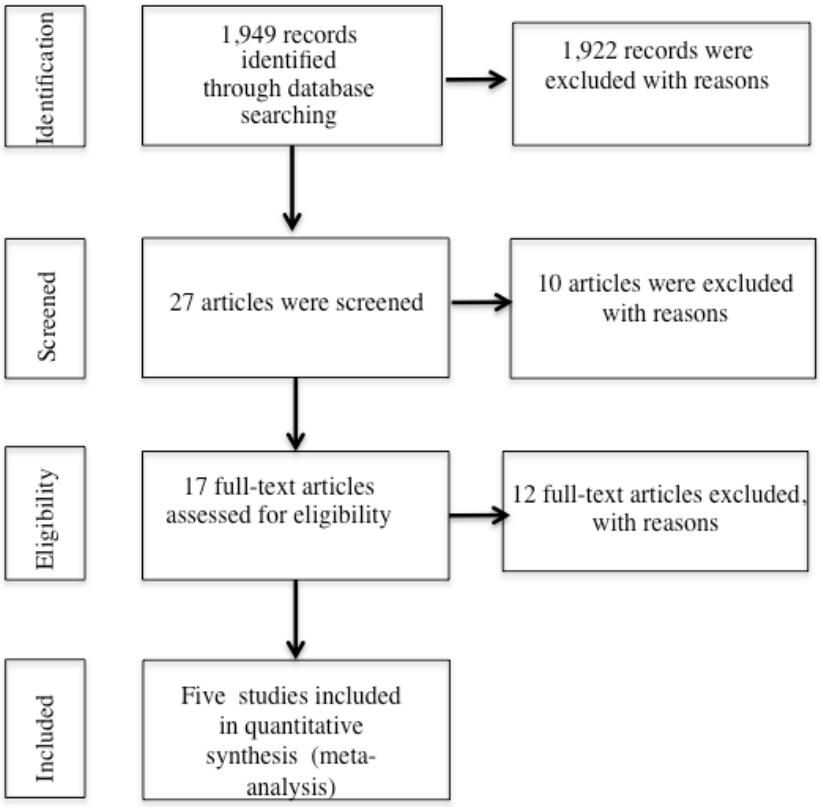
3.5.1 Method

3.5.1.1 Retrieval and criteria of studies

An exhaustive literature search using key words 'birth order' and 'agreeableness' in databases listed in Table 3.1 was conducted. The search limited the results to only those studies published between 1996-2013 and yielded 1,949 results. The search narrowed down results by filtering for records that included 'birth order' and 'agreeableness' in the abstract and/or keywords. Duplicate studies were removed, as were studies where there was no English translation available. Studies that consisted of adolescent or child samples were not included in the present study, nor were adoption studies or twin studies. In cases where articles did not include the relevant statistical

information required to generate the effect size, authors were contacted. If there was no response, these records were removed from this study. Five relevant studies were selected as they matched both the criteria and all necessary results able to be obtained in order to run the meta-analysis. Figure 3.4 displays a flow diagram of the study selection.

Figure 3.4 PRISMA Flow Diagram of study selections for birth order and agreeableness



3.5.1.2 Computations and statistical analyses

For five studies, Cohen's *d* for group differences was used. In some cases, *d* was calculated using means and standard deviations. In cases where means and standard deviations were unavailable, *t* or *F* values were converted to *d*. The Hunter-Schmidt Meta-Analysis Programs Package was used to compute the average weighted effect size, after imputing Cohen's *d* and the sample size for each of the five studies.

3.5.2 Results

The five studies included produced a total of N=5,392. The list of all five studies included is presented in Table 3.9 along with their corresponding sample sizes and effect sizes. The average weighted effect size for the five studies used in this meta-analysis was .167 (N=5,392; Credibility Interval: 10%CV=.067, 90%CV=.267). These results suggest a very small effect size.

Table 3.9
Effect sizes for studies measuring birth order and agreeableness

Study	Sample	Measures	*d*
Michalski & Shackelford (2002)	380	NA	-0.18
Paulhus, Trapnell & Chen (1999)	203	NA	0.07
Phillps (1998)	177	NEO-PI-R	0.14
Saroglou & Fiasse (2003)	122	NEO-PI-R	0.24
Sulloway (1999)	4,510	NEO-PI-R	0.20

Note. NA= name of measure not cited by author; NEO PI-R= NEO Personality Inventory Revised.

Three of the studies included in this meta-analysis measured personality via the NEO-PI-R and were included in an additional meta-analysis focusing on this style of measurement. The studies included in this analysis are included in Table 3.10. The average weighted effect size for the three studies included in this meta-analysis was .199 (N=4,809; Credibility Interval: 10%CV=.199, 90%CV=.199). These results

suggest a small effect size.

Table 3.10
Effect sizes for studies measuring birth order and agreeableness in studies with the NEO-PI-R

Study	Sample	*d*
Phillips (1998)	177	0.14
Saroglou & Fiasse (2003)	122	0.24
Sulloway (1999)	4510	0.20

3.5.3 Discussion

Findings from the current meta-analysis suggest that there is a small effect size found when analysing the results from the previous research included in this study even when all measures that do not include the NEO-PI-R are removed from the analysis. While the previous studies speculated that the non-significant results found were potentially due to the different facets within each trait, the same cannot be said for agreeableness. This trait is comprised of six facets (sincerity, altruism, trust in others, compliance, modesty and sympathy) that compliment each other and are often thought of as synonyms. Although not all birth order studies found support for the theory that later borns are more agreeable, no study has found that a reverse relationship exists. All across mainstream society individuals commonly associate later borns with being more easy-going and agreeable than their fist born siblings. As later borns enter into a family unit where they always have to share both parental and sibling attention and resources in ways that first borns at one point never had to do, it is a natural assumption that later borns score higher on this trait.

3.6 Study 5: Birth order and Conscientiousness

According to Sulloway (1995), conscientiousness is the only one of the Big Five

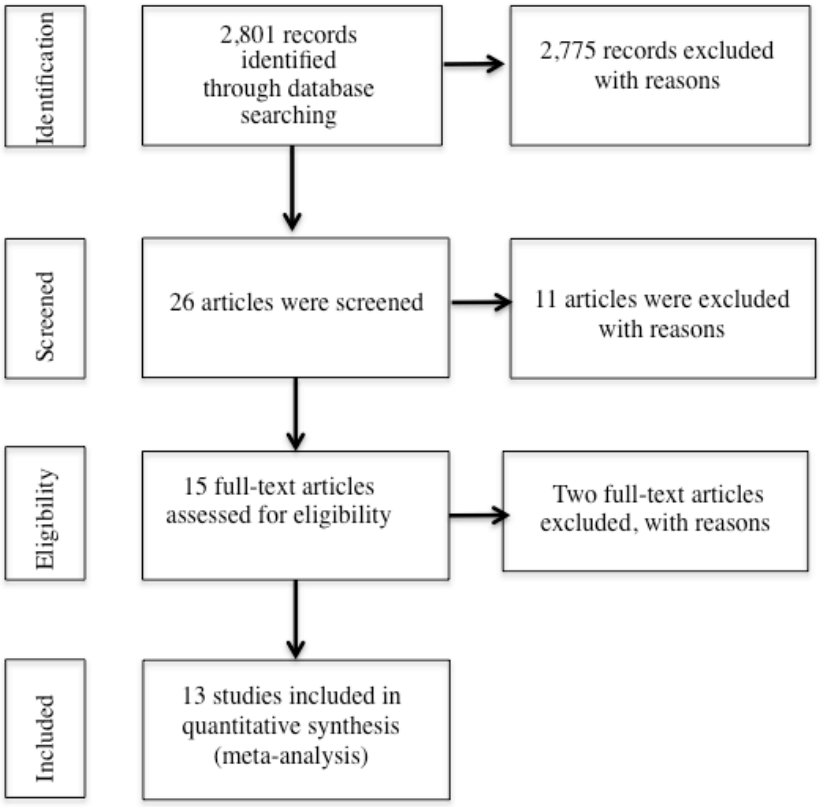
that first borns are expected to score higher on respective to later borns. The present study predicts that the findings of the current meta-analysis will support Sulloway's theory and suggest that the mean weighted effect size across all the studies will be medium.

3.6.1 Method

3.6.1.1 Retrieval and criteria of studies

A comprehensive literature search utilising the databases listed in Table 3.1 with keywords 'birth order' and 'conscientiousness' was conducted. The search also included only those studies published in the years 1996-2013 and produced 2,801 results. The results were then filtered to included only records of studies that included the words 'birth order' and 'conscientiousness' in abstract and/or keywords. The resulting 26 articles were screened and duplicates were removed as were articles where no English translation was found. Of the many studies found, 15 were identified as meeting the criteria for the current study. All studies involving children, adolescents, twins and non-biological siblings were removed from the current sample. Authors of studies that did not include enough relevant statistical information to be included in this study were contacted and removed if there was no response. The final number of studies included in this study is 13 and Figure 3.5 displays the study selection.

Figure 3.5 PRISMA Flow Diagram of study selection for birth order and conscientiousness



3.6.1.2 Computations and statistical analyses

For the 13 studies, Cohen's *d* for group differences was used. In some cases, *d* was

calculated using means and standard deviations. In cases where means and standard deviations were unavailable, *t* or *F* values were converted to *d*. The Hunter-Schmidt Meta-Analysis Programs Package was used to compute the average weighted effect size, after imputing Cohen's *d* and the sample size for each of the 13 studies.

3.6.2 Results

The 13 studies included produced a total of N=6,782. A complete list of the studies included in the meta-analysis is presented in Table 3.11 in addition to their corresponding sample sizes and effect sizes. The average weighted effect size for the 13 studies included in this meta-analysis was -.185 (N=6,782; Credibility Interval: 10%CV=-.54, 90%CV=.174).

Table 3.11
Effect sizes for studies measuring birth order and conscientiousness

Study	Sample	Measures	*d*
Badger & Reddy (2009)	46	IPIP-NEO	0.70
Healy, M. (2008)	131	NA	0.35
Healy, M. (2008)	133	NA	0.46
Healy & Ellis (2007)	161	NA	0.63
Healy & Ellis (2007)	174	NA	0.28
Michalski & Shackelford (2002)	380	NA	0.04
Paulhus, Trapnell & Chen (1999)	148	NA	0.11
Paulhus, Trapnell & Chen (1999)	194	NA	0.11
Paulhus, Trapnell & Chen (1999)	240	NA	0.10
Paulhus, Trapnell & Chen (1999)	369	NA	0.11
Phillps (1998)	177	NEO-PI-R	-0.24
Saroglou & Fiasse	122	NEO-PI-R	0.50
Sulloway (2001)	4,507	NEO-PI-R	-0.37

Note. NA= name of measure not cited by author; IPIP= International Personality Item Pool; NEO-PI-R= NEO Personality Inventory Revised.

Three of the studies included in this meta-analysis used the NEO-PI-R to measure conscientiousness as displayed in Table 3.12. A meta-analysis of these three studies found the average weighted effect size was -.341 (N=4,806; Credibility Interval:

10%CV=-.507, 90%CV=-.179).

Table 3.12
Effect sizes for studies measuring birth order and conscientiousness in studies using NEO-PI-R

Study	Sample	*d*
Phillips (1998)	177	-0.24
Saroglou & Fiasse (2003)	122	0.50
Sulloway (2001)	4507	-0.37

3.6.3 Discussion

The current meta-analysis did not find a large effect size in this analysis of the studies on birth order and conscientiousness either in the results of the 13 studies or when the three studies using the NEO-PI-R were analysed separately. However, it is interesting to note that the average weighted effect size for both analyses is negative. So while not significant, the direction of the relationship is in the predicted direction. There were fewer studies available for this meta-analysis and it can be speculated that with a larger sample size a significant relationship could be found. Many studies related to birth order and conscientiousness included variables other than the trait itself. For example, dozens of studies have investigated the relationship between intelligence and birth order. These studies found that first borns have a higher IQ than later borns (Bjerkedal et al, 2007). Therefore it can be hypothesized that there is a general negative relationship between birth order and factors associated with conscientiousness such as intelligence. This thesis is focusing on the Five Factor model and not their sub-factors nor associated factors, however it is worth noting that with more studies including the sub-factors of the Big Five birth order research may shed light on the discrepancies between Sulloway's hypothesis and the conflicting findings.

3.7 General Discussion

This chapter conducted a series meta-analyses on previous birth order literature relevant to the Big Five personality inventory. The rationale behind this study was to provide a new set of meta-analyses to follow up the work of Sulloway (1996) and include all recent relevant data. While there is a breadth of studies on birth order and personality, many were excluded from the current study for a variety of reasons. In order to properly compare previous research the studies chosen for inclusion had to display some similarities in sample groups and methodology. Only adult samples and were studies that consisted of full biological siblings were included. Adoption studies were excluded as these siblings share only environment and not genes. While all the studies included did not use the same measurement scale to assess each personality trait, they all were measures of self-perception. Any study where an individual was asked to rate his/her sibling was excluded from the meta-analyses. Once the studies were chosen and the analyses were run, the results found no evidence of birth order effects on any of the Big Five personality dimensions.

The series of studies in this chapter included a total of 45; out of that number 18 included studies that used the NEO-PI-R as the chosen instrument with which to measure the Big Five. While a handful of studies cited their measurements that included DPQ, NEO FFI and the MMPI, the bulk of the studies did not produce any information on this topic. The popularity of the NEO-PI-R was discussed in section 1.4.1.6.1 of this thesis and therefore it is no surprise that it was found in many of the studies included in the vast search that produced this meta-analysis. Since the NEO-PI-R was so widely used throughout many of these studies, additional meta-analyses were conducted using only those studies. In order to assess whether or not the use of the NEO-PI-R yields

different results than those where others were used, each personality trait was also analysed including only those studies in which the NEO-PI-R was used. With all of the various self-report measures of the Big Five it is not surprising that there is not one standard measure. It is however surprising that so many studies do not cite how they are measuring these traits. Without this information, it is difficult to determine whether or not these results were a product of the measures used and these studies cannot be replicated. It is therefore urged that future research include this information in order to ascertain whether or not it is the method of assessment that is playing a role in these findings.

Why is it that research does not find consistent support Sulloway's theory on birth order effects on personality? According to Ernst (2000), there are several factors responsible. Plomin and Daniels (1987) conclude that half of the variance in personality is genetic while the other half is environmental; Ernst argues that the flaw with birth order theories is assuming that siblings share the environmental factor as well. He asserts:

> The environmental variance is not due to the environment children living in the same family share with each other. On the strength of their individual personalities- of their vulnerability and resistance- children shape their own parents, peers, and teachers, and thus produce themselves the interaction with the environment they are shaped by (Ernst, 2000: 160).

Therefore, Ernst would find the results of the current meta-analysis conclusive with his overall theory that birth order effects on personality are myth based. In other words, it is how an individual grows up in their family rather than their position in the family.

While Sulloway (1996) acknowledges the importance of nature on individual differences, he believes that the nurture element associated with the need for survival within the family unit is instrumental in shaping one's personality. While the overall findings of the meta-analyses discussed in this chapter indicate that very small to small effect size found when analysing previous literature differences in methodology must be addressed and will be throughout the rest of this thesis.

3.8 Chapter Summary & A Look Ahead

Chapter 3 consisted of a series of five meta-analyses that examined birth order research on each of the Big Five personality traits respectively. The overall findings of the meta-analyses did not support Sulloway's theory on birth order effects on personality and did not replicate the significant findings of his 1996 meta-analysis. These meta-analyses did however support the running argument in Ernst and Angst's (1983) book that birth order effects are too complicated to break down into simple assumptions.

The experimental designs presented in the following chapters of this thesis aim to find more definitive claims on the nature of this relationship by using similar measures of assessment, sample groups, as well as comparing types of design.
The following chapter presents a between family design to examine the relationship between birth order and personality. This study will assess six personality traits including the Big Five and trait EI.

Chapter 4: Birth order, the Big Five & Trait EI- A Between Family Study

4.1 Introduction

As stated throughout this thesis, theories relating birth order to personality traits continue to be of popular interest in the academic arena, mainstream society, and the media. The order in which an individual is born in relation to his or her siblings (e.g., only child, first, middle, youngest), known as birth order, is said to have an influence on an individual's characteristics. It is a commonly held notion that first borns are leaders, while youngest borns are often said to be more rebellious. Sulloway traces his hypotheses as far back as Darwin (1859) who suggested that differences amongst siblings are a result of survival mechanisms and first borns tend to be stronger and bigger, leading them to have a greater reproductive value to their parents (Sulloway, 1995). According to evolutionary psychology, sibling rivalry is Darwinian logic and part of the survival of the fittest. In order for siblings to stand out and find their niche in the family they develop unique roles different from their siblings. This thesis explores the ways in which siblings differ in personality.

Sulloway (1996) generated hypotheses regarding the relationship between birth order and the Big Five personality domains. Due to the different facets that comprise each of the Big Five, Sulloway (1996) found it difficult to make definitive claims for associations between birth order and neuroticism or extraversion. For example, the facets comprising neuroticism include anxiety and self-consciousness, and whereas first borns are more anxious, vulnerable and prone to depression, later borns are more self-conscious. Therefore, Sulloway's (2000a) theory asserts that while later borns score lower on the anxiety facet, they score higher on self-consciousness; so similar global scores on neuroticism would be predicted. Thus the relationship between birth order

and neuroticism remains inconclusive, at least at the global level of the trait (Dixon et al, 2008; Paulhus et al., 1999).

As in the case of neuroticism, Sulloway (1996) had difficulty determining the exact nature of the relationship between extraversion and birth order. Extraversion is made up of six facets, including: warmth, gregariousness, assertiveness, activity level, excitement-seeking and positive emotions. While one facet, gregariousness, often referred to as sociability, leads to the prediction that later borns are more out-going and therefore more extraverted, another, assertiveness, seems to best describe the older borns, as it is their natural role in the family to take charge as a leader amongst their siblings. Again, according to Sulloway moderate scores on total extraversion would be predicted for both birth order positions.

Beck et al. (2006) designed a study to test Sulloway's predictions on facets of extraversion. Participants were asked to rate both themselves and their siblings on the 12-item extraversion scale taken from the Revised NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992), which measured two components of extraversion: sociability and dominance. More specifically, the sociability cluster comprised seven items assessing gregariousness, positive emotions and warmth, while the dominance cluster comprised five items assessing activity, assertiveness, and excitement (Beck et al., 2006). In accordance with Sulloway's predictions, the researchers found that first borns score higher on dominance and later borns score higher on sociability. In other words, scores on these two facets of extraversion differ in opposite ways as a function of birth order (Jefferson, Herbst, & McCrae, 1998).

Sulloway did however develop hypotheses relating to the direction and relationship between birth order and the other three personality traits. He predicted that

later borns are more likely to be open to experience than their older siblings, as this construct is related to being rebellious, unconventional and adventurous; these are all characteristics Sulloway claimed to be associated with later borns. He asserted that later borns are more likely to question authority and take risks in an attempt to seek parental attention. In regard to conscientiousness, Sulloway (1996) argued that first borns are more conscientious than their later born siblings due to first borns being more likely to want to please their parents than to take risks. This is because first borns are seeking parental approval and thus are more likely to display behaviours that reflect their parents' values. Sulloway (1996) also claimed that later borns tend to be more agreeable than their older siblings, as they are physically weaker growing up. In order to solicit their parents' attention and minimize confrontation with their siblings, later borns tend to be more agreeable e.g., flexible, selfless, and warm.

4.2 Study 6: Birth order and the Big Five

4.2.1 Introduction

The central aim of the first of the two linked studies reported in this thesis was to evaluate Sulloway's hypotheses that later borns will score higher on agreeableness and openness than first borns who will score higher on conscientiousness. By using a psychometrically sound measure such as the IPIP, this study takes Beck et al's (2006) critcisms of Paulhus et al's findings on birth order effects on personality into account. For the following hypotheses, first borns include only and oldest children while later borns include middle and youngest. However, analyses were conducted to investigate if more differences arise between the four birth order groups. This study also assesses personality differences between individuals with siblings and only children. It is

predicted that only children will score similarly to first borns on the Big Five.

Additionally, Study 6 examines the correlation between the number of siblings and the Big Five. There is no literature that explores this correlation so this aspect of the study is largely exploratory. In some families, the number of siblings may be different from the number of siblings that spent the majority of their upbringing together. This could be a result of either large gaps in the ages between siblings or siblings moving out of the home for various reasons such as attending schools far away or living with other relatives. For this reason, an additional variable will be examined to see if the number of siblings growing up in the same house the majority of time correlates with the different personality factors.

The Birth Order Questionnaire (BOQ) used throughout this thesis gathers information on both variables in order to ascertain what impact growing up with your siblings has on personality. There is no literature currently available on this topic therefore the studies in this thesis regarding this relationship are exploratory. For a complete look at the items on the BOQ please see Appendix I. One critique of the studies used in the meta-analyses discussed in Chapter 3 was the limited information regarding birth order. This questionnaire is designed in order to place participants into four definitive birth order groups unlike most birth order literature that places the individuals into two groups- first and later borns. By using the BOQ, Study 6 differs from previous studies on the relationship between birth order and the Big Five and aims to find significant results that were not found in Chapter 3. The current study makes the following predictions regarding the relationship between birth order and the Big Five:

H1: Later borns will score higher on agreeableness and openness than first borns

H2: First borns will score higher on conscientiousness than later borns

H3: Individuals with siblings will score higher on agreeableness than only children

H4: There will be a negative correlation between the number of siblings and conscientiousness scores

H5: Participants with siblings will score higher on extraversion than only children

H6: Extraversion scores will be positively correlated with number of siblings

4.2.2 Method

4.2.2.1 Participants

Participants included 260 (Males=72, Females=188) individuals between the ages of 18 and 40 recruited through friends, family, colleagues and University students who were asked to complete a web-based questionnaire in one sitting and submit on-line. The mean age was 28.81 years (*SD*=5.34). Participants grew up in a total of 38 different countries and those who spoke English as a second language were removed from the study (n=51). Participants belonged to one of four birth order groups represented in Table 4.1. Middle children represented all individuals who identified themselves as such, they are not first borns or last borns, but they are somewhere in between. According to this definition of middle children, there may be more than one middle child per family; however participants were asked to place themselves into the group in which they most closely identify. Those individuals who are one of several *middle children* and do not consider themselves to fit into that category were given the option to leave the box blank or choose the category labelled *other*. Table 4.2 presents the number of siblings each participant has and Table 4.3 displays the number of

siblings each participant grew up in the same house with the majority of time (7+ years).

Table 4.1
Distribution of birth order groups

Only Children	Oldest Children	Middle Children	Youngest Children
50	94	36	80

Table 4.2
Number of siblings

0	1	2	3	4	5	6	7
47	108	74	20	6	1	2	2

Table 4.3
Number of siblings growing up together

0	1	2	3	4	5	6
51	121	63	15	2	2	1

4.2.2.2 Materials

International Personality Item Pool (IPIP; Goldberg, 1999). The IPIP is a 50-item measure of personality that utilizes a 5-point Likert rating scale. A score for each of the Big Five personality factors was generated from the IPIP. The IPIP has shown good reliability and validity (Goldberg, 1999) and the Cronbach's alpha for each trait is presented in Table 4.4. A more detailed description of the IPIP is discussed in Section 1.4.1.6.2 and a copy of the scale is displayed in Appendix IV of this thesis.

Table 4.4
Reliability of IPIP Scales

Factor	Cronbach's Alpha
O	0.74
C	0.84
E	0.88
A	0.76
N	0.83

Birth Order Questionnaire: A lack of appropriate and comprehensive measures of birth order led to the present study's development of the Birth Order Questionnaire (BOQ). The BOQ contains 21 items related to birth order, as well as additional questions aimed to capture relevant socio-demographic information. Questions relating to birth order focused on ordinal position, gender, and age spacing. More specifically, it gathered information regarding not only whether an individual was the youngest or oldest, but the ages and genders of their siblings as well. In addition, the questionnaire gathered information pertaining to half-siblings, step-siblings, adopted, and foster siblings in order to ascertain which individuals had full biological siblings and which did not. This questionnaire was first used in a pilot study (N=55) and participants were asked to identify which if any of the items were confusing to them and record how long the survey took them to complete. The feedback from the pilot study refined the questionnaire making amendments where necessary. The BOQ currently represents the most comprehensive measure of birth order and can be used to gather a large variety of data points. For more information regarding the items on this survey, a copy of this measure is presented in the Appendices section of this thesis.

4.2.2.3 Design and procedure

Participants were directed to an on-line link where they were asked to complete a total of three surveys in one sitting, as the website was not designed to save drafts. Participants were informed that the central aim of the study was to investigate the relationship between birth order and personality. According to Paulhus et al. (1999), birth order effects on personality are not influenced by participants' knowledge of the variables whilst completing the study. This suggests that participants do not display a

bias in answering self-report measures when they know what is being measured. Participants were told that their answers were completely anonymous and all questionnaires were given an identification code in order to track data whilst maintaining confidentiality. This study employed a between-family design, participants consisted of individuals rather than sets of siblings. A within-family design is presented in Chapter 6 and a discussion will follow on a comparison of the results.

4.2.3 Results

A one-way between groups analysis of variance was conducted to examine the relationship between the Big Five and the four different birth order groups. There was no significant difference in scores between the birth order groups for neuroticism, conscientiousness or agreeableness. There was a statistically significant difference at the $p<.01$ level in the extraversion scores for the birth order groups [$F(3, 259)= 3.17$, $p=.02$]. The effect size calculated using eta-squared was .04. There was also a statistically significant difference at the $p<.05$ in the openness scores for the birth order groups [$F(3, 259)=3.5$, $p=.02$]. The effect size calculated using eta squared was .04. Post hoc results showed a similar effect pattern for both traits with the oldest and youngest siblings scoring significantly higher on extraversion than the middle children. The mean scores and standard deviations are represented in Table 4.5.

Table 4.5
Means and Standard Deviations for the Big Five

	Only		Oldest		Middle		Youngest	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Agreeableness	3.60	0.54	3.72	0.54	3.58	0.56	3.71	0.55
Conscientiousness	3.47	0.61	3.61	0.65	3.46	0.72	3.58	0.61
Extraversion	3.69	0.73	3.77	0.68	3.42	0.79	3.85	0.69
Neuroticism	2.68	0.63	2.60	0.76	2.67	0.82	2.45	0.69
Openness	3.74	0.70	4.01	0.59	3.70	0.64	3.97	0.65

A t-test was conducted to examine the personality differences between individuals who grew up with two guardians (N=230) and individuals raised by a single guardian (N=25). A guardian is defined as a natural parent, step-parent, foster parent or other relative. Results were not significant and suggest that whether one or two guardians raise an individual has little impact on their personality. Table 4.6 presents a summary of the findings.

Table 4.6
T-test results for two guardians v. one guardian

		M	*SD*	*t*(255)	*r*
Agreeableness				0.82	0.03
	Two guardians	3.66	0.55		
	One guardian	3.78	0.51		
Conscientiousness				1.01	0.05
	Two guardians	3.54	0.67		
	One guardian	3.23	0.63		
Extraversion				0.58	0.04
	Two guardians	3.67	0.70		
	One guardian	3.56	0.73		
Neuroticism				-0.47	0.05
	Two guardians	2.59	0.70		
	One guardian	2.66	0.67		
Openness				1.79	0.10
	Two guardians	3.88	0.65		
	One guardian	3.75	0.69		

For further analysis of birth order effects, a t-test was conducted to explore the personality differences between only children (n=46) and individuals (n=214) with siblings. Results (displayed in Table 4.6) were not significant suggesting that whether or not an individual has siblings has little impact on their personality.

Table 4.7
T-test results for siblings v. non-siblings

	M	*SD*	*t*(258)	*r*
Agreeableness			0.77	0.05
With siblings	3.69	0.54		
Without siblings	3.62	0.53		
Conscientiousness			1.12	0.07
With siblings	3.58	0.64		
Without siblings	3.45	0.63		
Extraversion			0.56	0.03
With siblings	3.74	0.72		
Without siblings	3.68	0.72		
Neuroticism			-0.42	0.03
With siblings	2.57	0.75		
Without siblings	2.62	0.63		
Openness			1.97	0.12
With siblings	3.94	0.63		
Without siblings	3.73	0.71		

A Pearson correlation analysis was also conducted to see if the number of siblings correlated with Big Five scores, the results were non-significant and are displayed in Table 4.8.

Table 4.8
Correlations between the number of siblings and the Big Five

	N	*r*	*p*
Agreeableness	260	0.04	0.55
Conscientiousness	260	0.06	0.35
Extraversion	260	0.03	0.60
Neuroticism	260	-0.07	0.28
Openness	260	0.08	0.20

A second correlation was run to see if the number of siblings growing up in the same house the majority of the time correlated with any of the Big Five scores. The results of this Pearson correlation are displayed in Table 4.9. These findings suggests

that Big Five scores are not impacted by the number of siblings an individual has regardless of whether or not they spent the majority of their upbringing with their siblings.

Table 4.9
Correlations between the number of siblings growing up together and the Big Five

	N	*r*	*p*
Agreeableness	260	0.08	0.18
Conscientiousness	260	0.03	0.61
Extraversion	260	0.03	0.68
Neuroticism	260	-0.09	0.15
Openness	260	0.02	0.74

4.2.4 Discussion

The aim of the present study was to find additional evidence for Sulloway's theory on the relationship between birth order and the FFM. The original hypotheses of the study were not supported by the current results, however new insights emerged. Although it was predicted that younger borns would score higher on the trait openness, this study found an interesting zigzag pattern amongst the birth order groups with both first and youngest scoring significantly higher than middle children. Despite Sulloway's suggestion that there is no definitive relationship between birth order and extraversion, a zigzag pattern was found among the birth order groups on this trait also, with both oldest and youngest borns scoring significantly higher than middle children. This finding is particularly interesting in that it does suggest that first borns and later borns are scoring high on different facets of extraversion as Sulloway claims.

Several studies have found birth order effects on openness (Healy & Ellis, 2007; Paulhus et al., 1999; Saroglou & Fiasse, 2003), however their findings generally suggest

that younger borns score higher than first borns, with the exception of Saroglou and Fiasse (2003) who found that middle borns are more open to fantasy than their first born and later born siblings. One of the differences between the results of the current study and these contradictory results concerns the methodology. The current study employed a between-families design while these other studies employed a within-family design. Study 10 presented later in this thesis utilises a within family design; it will be worth noting whether the findings in that study replicate the current design or previous research that employed the within family design.

In addition to exploring the relationships between the different birth order groups and the Big Five factors, this study also explored correlations between the number of siblings and the trait variables. Results showed that there were no differences in any of the Big Five factor scores between only children and children with siblings. Additionally, the number of siblings had no impact on Big Five scores regardless of whether or not the participant grew up with them or not. While the BOQ also generated information regarding the genders of one's siblings and age spacing the sample size was too small to carry out those analyses. This study also found no significant personality differences between individuals reared by two guardians and one guardian. Study 7 examines the relationship between the same independent variables assessed in the current study with trait EI as the dependent variable.

4.3 Study 7: Birth Order and Trait EI

4.3.1 Introduction

This study is the first of its kind to examine the relationship between birth order and trait EI and hypothesizes that later borns will have a higher trait EI score than both

first borns and only children. As in Study 6, the current study explores the correlation between the number of siblings and trait EI scores as well as correlation between the number of siblings growing up in the same household and trait EI score. This study also tests the prediction that there will be a positive relationship between the number of siblings an individual has and their trait EI scores. The hypotheses presented in this study are largely exploratory due to the lack of existing literature on the relationship between birth order and trait EI. Study 7 makes the following predictions:

H1: Later borns will score higher on trait EI than first borns and only children

H2: The number of siblings an individual has will be positively correlated with their trait EI scores.

4.3.2 Method

4.3.2.1 Participants

Participants were from the same participant pool as in Study 6, in the current study 236 (Males=61, Females=175) completed the online questionnaire. The age of the participants ranged from 18-40 years and the mean age was 28.49 (SD=5.73). As in Study 6, participants who spoke English as a second language (n=46) were removed from the sample. Table 4.10 displays the number of participants in each of the four birth order groups. The distribution of the number of siblings is represented in Table 4.11 and the distribution of the total number of siblings growing up in the same house the majority of the time is shown in Table 4.12.

Table 4.10
Distribution of birth order groups

Only Children	Oldest Children	Middle Children	Youngest Children
43	88	28	77

Table 4.11
Number of siblings

0	1	2	3	4	5	6	7
44	96	70	17	4	1	2	2

Table 4.12
Number of siblings growing up in the same house the majority of time (7+ years)

0	1	2	3	4	5	6
44	96	70	17	4	1	2

4.3.2.2 Materials

Trait Emotional Intelligence Questionnaire- Short Form **(TEIQue-SF;** Petrides 2009; see also Petrides & Furnham, 2006; Cooper & Petrides, 2010). The TEIQue –SF is a short form of the 153-item TEIQue questionnaire and generates one global trait EI score and four facet scores. Like the TEIQue, the short-form is a self-report measure that is responded to on a 7-point Likert scale. The TEIQue-SF has shown good reliability and validity (Petrides & Furnham, 2006) and the Cronbach's Alpha in this study was .90. A full description of this scale is presented in Section 1.4.2.4.

Birth Order Questionnaire: Socio-demographic and birth order information was obtained using the same birth order questionnaire that was used in Study 6.

4.3.2.3 Design and procedure

The design and procedure were identical to Study 6.

4.3.3 Results

A one-way analysis of variance was conducted to examine the mean differences for the trait EI scores for the birth order groups. No significant differences were found in global trait EI scores or the four factor scores between the birth order groups, the mean scores are shown in Table 4.13.

Table 4.13
Means and Standard Deviations for Trait EI

	Only		Oldest		Middle		Youngest	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Total Trait EI	5.09	0.74	5.26	0.72	5.09	0.69	5.29	0.61
Well Being	5.61	0.99	5.80	0.99	5.56	1.05	5.84	0.82
Self Control	4.48	1.03	4.44	1.05	4.61	1.01	4.59	0.89
Emotionality	5.13	0.91	5.45	0.83	5.10	0.89	5.36	0.78
Sociability	5.08	0.92	5.17	0.95	4.98	0.82	5.19	0.90

A t-test was conducted to examine differences in global trait EI and the four factors between individuals who grew up with two guardians (N=209) and individuals raised by a single guardian (N=18). A guardian is defined as a natural parent, step-parent, foster parent or other relative. Table 4.14 presents a summary of the findings, which suggest that there is no significant difference in trait EI scores between individuals raised by two guardians or one.

Table 4.14
T-test results for two guardians v. one guardian

		M	*SD*	*t*(277)	*r*
Global Trait EI				1.46	0.08
	Two guardians	5.02	0.59		
	One guardian	4.99	0.77		
Well being				1.08	0.06
	Two guardians	5.75	0.95		
	One guardian	5.69	0.95		
Self-control				0.31	0.03
	Two guardians	4.55	0.97		
	One guardian	4.51	0.99		
Emotionality				1.63	0.17
	Two guardians	5.41	0.85		
	One guardian	5.45	0.89		

Sociability				0.64	0.05
	Two guardians	5.08	0.91		
	One guardian	5.01	0.90		

A t-test was also conducted to examine the difference in trait EI scores between individuals with siblings (n=192) and individuals without siblings (n=44), and no significant difference was found. Results are displayed in Table 4.15.

Table 4.15
T-test results for siblings v. non-siblings

	M	*SD*	*t(234)*	*r*
Global Trait EI			1.45	0.09
With siblings	5.25	0.68		
Without siblings	5.08	0.73		
Well being			1.06	0.07
With siblings	5.78	0.94		
Without siblings	5.62	0.98		
Self-control			0.28	0.02
With siblings	4.52	0.99		
Without siblings	4.48	1.01		
Emotionality			1.65	0.11
With siblings	5.37	0.83		
Without siblings	5.14	0.90		
Sociability			0.53	0.03
With siblings	5.15	0.90		
Without siblings	5.07	0.91		

Finally, the relationship between the number of siblings and trait EI scores was explored using a Pearson-product correlation. Two separate analyses were conducted. The first analysis assessed the correlation between the total number of siblings the individual has and the second more specifically looked at the total number of siblings that grew up in the same house the majority of time the individual did. The first analysis found no significant relationship between the number of siblings and global trait EI or the four factors. In the second analysis, there was a positive correlation

between the number of siblings growing up in the same house with global trait EI [r=.14, n=232, p<.05] and self-control [r=.15, n=232, p<.05]. These correlations are displayed in Graphs 4.3 and 4.4 respectively. There was no significant correlation found between the number of siblings growing up in the same house with well being, emotionality or sociability. Results of both analyses are displayed in Table 4.16.

Table 4.16
Correlations between the number of siblings and trait EI

	Total Number of Siblings			Total Number of Siblings Growing Up in the Same House		
	N	*r*	*p*	*n*	*r*	*p*
Global trait EI	236	0.13	0.05	232	0.14*	0.03
Well being	236	0.08	0.24	232	0.08	0.20
Self-control	236	0.10	0.14	232	0.15*	0.03
Emotionality	236	0.10	0.13	232	0.09	0.15
Sociability	236	0.08	0.24	232	0.07	0.29

* Correlation is significant at the .05 level

As shown in Table 4.12, seven individuals have more than three siblings, an amount much smaller than the other groups. For this reason the Pearson correlation was analysed again, this time removing those individuals who have more than three siblings. With the removal of those seven individuals the results of the correlation between the number of siblings growing up in the same house and trait EI scores were not significant. The results of the Pearson correlation are displayed in Table 4.17.

Table 4.17
Correlations between the number of siblings growing up together and trait EI

	Total Number of siblings growing up in the same house (n=227)	
	r	*p*
Well being	0.07	0.27
Self-control	0.11	0.09
Emotionality	0.11	0.09

Sociability	0.04	0.54
Global trait EI	0.12	0.08

4.3.4 Discussion

The current study was the first of its kind to examine the relationship between birth order and trait EI. The main hypotheses regarding this relationship predicted that later borns would score higher on trait EI than first borns and only children. These hypotheses are born out of the notion that later borns enter the world with an innate need to find their niche in their family model. By being aware of their emotions, and those of significant people around them, later borns, in theory, would increase their survival rate.

A relationship was not found between the global trait EI score and birth order. Additionally, no relationships were found between birth order and the four facets of trait EI. This study also found no relationship between trait EI scores and whether or not one or two parents raised an individual. Furthermore, this study found no significant difference in trait EI scores for individuals growing up with siblings and only children. As this was the first study examining trait EI and birth order, more research should be conducted to lend support to the current study and see if the results are replicated or if the original hypotheses are found.

This study found no correlation between the number of siblings and global trait EI or any of the four facets. However, a positive correlation was found between the number of siblings growing up in the same house together and self-control and with global trait EI. As evidenced in Graphs 4.3 and 4.4 only seven participants had more than three siblings. For this reason, the analysis was conducted again removing those participants. In this case, there were no significant correlations between the number of

siblings and global trait EI or the four factors. However, when looking at the *p* values in Table 4.15 self-control, emotionality and global trait EI are <.10 suggesting that with a larger sample size there could be significant correlations between these variables. Chapter 5 is a follow up to this study and uses the full TEIQue, a more comprehensive measure of trait EI, that can help us examine all trait EI factors and facets.

4.4 General Discussion

These two between family studies investigated the relationship between birth order and six personality traits and yielded some new and interesting findings as presented in the results section. For the Big Five, the zigzag pattern found for both extraversion and openness provides a new way to look at birth order effects. This study did not find any birth order effects in trait EI. While this finding did not support the original hypotheses, this exploratory study provides novel information into the relationship between birth order and trait EI.

One limitation of the current study may be the unequal size of the birth order groups, which ranges between 28 and 88, making it difficult to compare variables such as gender within the groups. Although results were not predicted to vary by gender, a larger sample size would allow us to see if, for example, first born girls differed from first born boys. While the study had a substantial sample size of over 200, future studies should aim to have a much larger size in attempts to both balance the birth order groups as well as look at more specific variables. These variables include age spacing, as well as gender amongst siblings, which could also be investigated through a large scale within family design. Age spacing refers to the number of years between siblings. A larger sample size would yield substantial group sizes to assess if the number of years

between siblings has an impact on their personality. As for gender, is logical to presume that a female growing up in a sibship set of males would differ if she were to grow up in a sibship set of females. A within family design consisting of same gender and mixed gender would be the best way to approach this hypothesis and will be discussed in more detail in Chapter 6. While the current study did not have a large enough sample size to investigate this theory, future research on this relationship would shed new light into the relationship between birth order and trait EI.

Another potential limitation was the between subjects design. Although a greater sample size was obtained with this between subjects design, it is important to ask if different results would have been found in a within subjects design. There are two key advantages to using a within family design; firstly, they control for individual differences between participants, thus increasing power. Individual differences are controlled because the conditions are always exactly equivalent, since participants (siblings) are the same across the different conditions. Future research must take these methodological issues into account in an effort to form a more conclusive argument on the relationship between birth order and personality.

A large scale within family design utilizing the measures used in the current study would aim to overcome any of the potential limitations discussed. Additionally, other variables such as sibship size and the gender of an individual's siblings could be examined to see what role being from a large family plays, or if there are differences found for a female growing up in a house of brothers as opposed to in a house of sisters. Future studies may also wish to look at non-traditional families, including step-siblings and adopted siblings in an attempt to further explore the nature vs. nurture debate in personality.

4.5 Chapter Summary & A Look Ahead

This chapter presented two between family designs measuring the relationship between birth order with the Big Five and trait EI respectively. The first study found that oldest and youngest borns scored higher on both extraversion and openness than middleborns. This suggests that first borns and later borns are more similar in personality than middle children. Chapter 6 will investigate this further in a within family study utilizing sibling sets from three sibling families. The second study presented in Chapter 4 found that there were no significant birth order effects for trait EI or any of the four broad factors when trait EI is assessed via the TEIQue-SF. The following Chapter will look deeper into the relationship between birth order and trait EI in a between family study where trait EI is measured via the longer form, the TEIQue.

Chapter 5: Birth Order & trait EI: A Between Family Study

5.1 Introduction

This chapter introduces the first in-depth analysis of the relationship between birth order and trait EI. By differing sample groups and methodologies one of the goals of this thesis is to determine a relationship between the two variables in a series of studies. In Chapter 4 trait EI was examined in a between family study and was measured via the TEIQue-SF (Cooper & Petrides, 2010). This measure is a short form of the longer TEIQue questionnaire and provides the four trait EI factors and the global trait EI score. According to the results found using this questionnaire there is no relationship between birth order and the four trait EI factors or global trait EI. To further explore this, the present chapter investigates the relationship between birth order and trait EI using the full 153-item Trait EI Questionnaire (TEIQue; Petrides, 2009) in two between family studies. This study will not only see if the results of Study 7 will be replicated but will also look more closely at the facets of trait EI as the TEIQue yields scores of all 15 sub-facets in addition to the four broad factors and global trait EI score.

Trait EI can be defined as a constellation of emotional self-perceptions located at the lower levels of personality hierarchies (Petrides, Pita, & Kokkinaki, 2007). Unlike other theories of emotional intelligence, this thesis stipulates that trait EI lies outside the taxonomy of human cognitive abilities (Carroll, 1993). The TEIQue measures trait EI through a series of self-perception questions. With 153 questions in total this measure provides scores for the entire sampling domain of trait EI including 15 distinct facets and four factors: Emotionality (facets: emotion-perception, empathy, emotion expression, and relationships), Self-control (facets: emotion control,

impulsivity, and stress management), Sociability (facets: emotion management, assertiveness, and social awareness), and Well-being (facets: happiness, optimism, and self-esteem). The remaining two trait EI facets (adaptability and self-motivation) are covered in the global trait EI score (Vernon et al, 2009). The hypotheses presented in the following studies are based on Sulloway's evolutionary perspective on birth order and his theories on the family dynamics model (discussed in Chapters 1 and 2), which he argues to be key contributors to differences in personality and will be presented in each study below.

5.2 Study 8: Trait EI and Ordinal position

5.1 Introduction

The aim of Study 8 is to provide a thorough examination of the effects of ordinal position on trait EI in a large sample of adult participants. Ordinal position is defined as the number position within the sibling unit to which one identifies him/her self. For example, first born, second born, etc. In addition to the trait EI questions, the TEIQue provides a set of socio-demographic questions including asking participants their ordinal birth position.

As first borns are said to be conform to the status quo (Sulloway, 1996), the following study predicts that they will score higher on the self-control factor of trait EI. Individuals with high self-control are able to control their impulses and will often avoid risk-seeking behaviours. Risk-seeking and rebelliousness are traits often associated with later borns, thus the following study also predicts that there will be a significant negative relationship with self-control and ordinal position. This would show that self control scores decrease as ordinal position increases, therefore an individual whose

ordinal position is 5th would score lower on this factor than a first born. More specifically, this relationship is also predicted to exist across the self-control facets including emotion control, impulsivity and stress management.

With the exception of self-control, this study predicts that global trait EI and the other three broad factors will be higher for later borns and increase as the ordinal position goes further down the line. According to Sulloway and Zweigenhaft (2010), sibling competition for parental resources is universal. When later borns come into the sibship set they must learn quickly how to survive amongst their siblings as well as strive to achieve the same parental resources. In order to achieve this they must be able to regulate their own emotions as well as their siblings from a young age. As this is an integral part of the definition of trait EI it can be hypothesized that later borns will have higher trait EI scores than first borns.

H1: First borns will score higher on self-control and impulsivity (low)

H2: Later borns will score higher on relationships

H3: Later borns will score higher than first borns on emotionality, well-being and sociability

H4: Later borns will score higher on global trait EI.

5.2.2 Method

5.2.2.1 Participants

The participants comprised 1,602 individuals of whom 829 were men and 775 were women (3 participants did not record their gender). Participants were recruited from University campuses and from the general community. The age of the sample ranged from 17 to 77 years, with a mean age of 32.40 (*SD*= 11.49). Questionnaires were administered via paper and pen or via the Internet and took approximately 20

minutes to complete. Participants were asked to record their order of birth (e.g. first, second, third, fourth, fifth, sixth). There were 696 first borns and 910 later borns; the distribution of the groups is shown in Table 5.1.

Table 5.1
Distribution of Ordinal Positions

First	Second	Third	Fourth	Fifth	Sixth
692	508	244	95	37	26

5.2.2.2 Materials

Trait Emotional Intelligence Questionnaire (TEIQue; Petrides, 2009); The full form of the TEIQue self-report measure was used, which comprises 153-items and provides comprehensive coverage of the sampling domain of trait EI. All items are scored on a 7-point Likert scale and the questionnaire provides 20 individual scores, one for each of the 15 facets, 4 factors, and global trait EI. Table 1.2 in Section 1.4.2.4 displays all 15 trait EI facets and provides more detailed information on the validity of the TEIQue. Sample items include *I'm usually able to influence the way other people feel* and *I'm usually able to deal with problems others find upsetting* and participants were asked to record how strongly they agree or disagree.

5.2.3 Results

An independent samples t-test was conducted to compare the TEIQue scores for the first and later borns. There was no significant difference in scores for first and later borns for any of the trait EI facets or the global trait EI scores. Table 5.2 displays the results including the means, standard deviations, t-values and the effect size.

Table 5.2
T-test results for Birth Order and Trait EI

	M	*SD*	*t(1600)*	*d*
Self-esteem			-0.69	0.02
First borns	5.08	0.92		
Later borns	5.10	0.94		
Emotion expression			0.39	0.01
First borns	4.89	1.17		
Later borns	4.87	1.22		
Self-motivation			-0.93	0.02
First borns	4.86	0.82		
Later borns	4.89	0.85		
Emotion regulation			-1.75	0.04
First borns	4.50	0.94		
Later borns	4.59	0.96		
Happiness			-0.60	0.01
First borns	5.66	0.97		
Later borns	5.69	0.98		
Empathy			0.14	0.00
First borns	5.21	0.79		
Later borns	5.20	0.78		
Social awareness			-0.47	0.01
First borns	5.13	0.92		
Later borns	5.15	0.95		
Impulsivity			-0.77	0.02
First borns	4.69	0.99		
Later borns	4.73	0.99		
Emotion perception			-0.67	0.02
First borns	4.93	0.82		
Later borns	4.96	0.85		
Stress management			-1.64	0.04
First borns	4.64	1.02		
Later borns	4.72	1.01		
Emotion management			0.174	0.00
First borns	4.97	0.80		
Later borns	4.96	0.87		
Optimism			-1.15	0.03
First borns	5.33	0.96		
Later borns	5.39	0.95		
Relationships			-1.30	0.03
First borns	5.53	0.80		
Later borns	5.59	0.80		
Adaptability			-1.14	0.03
First borns	4.76	0.87		
Later borns	4.81	0.89		
Assertiveness			-0.93	0.02

First borns	4.97	0.95		
Later borns	5.01	0.94		
Well being			-0.93	0.02
First borns	5.36	0.82		
Later borns	5.39	0.83		
Self-Control			-1.61	0.04
First borns	4.61	0.85		
Later borns	4.69	0.84		
Emotionality			-0.36	0.00
First borns	5.14	0.72		
Later borns	5.15	0.74		
Sociability			-0.49	0.01
First borns	5.02	0.77		
Later borns	5.04	0.80		
Global trait EI			-1.10	0.03
First borns	5.01	0.63		
Later borns	5.04	0.66		

An ANOVA was conducted to see if there were any significant differences in scores between the six groups. Results showed that there was no significant difference in scores between any of the groups for the trait EI facets and the global trait EI score. Table 5.3 displays the means and standard deviations for birth order and trait EI scores.

Table 5.3
Means and Standard Deviations for Ordinal Position and Trait EI

	1st Borns		2nd Borns		3rd Borns		4th Borns		5th Borns		6th Borns	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Self Esteem	5.08	.92	5.10	.90	5.13	.94	5.21	0.96	5.01	1.14	4.86	1.13
Emotion Expression	4.89	1.17	4.88	1.24	4.89	1.19	4.90	1.20	4.89	1.05	4.35	1.39
Self-motivation	4.86	0.82	4.88	0.83	4.92	0.91	4.95	0.74	4.73	0.98	4.92	0.77
Emotion Regulation	4.50	0.94	4.57	0.93	4.54	0.99	4.68	0.95	4.71	1.09	4.86	0.89
Happiness	5.66	0.97	5.74	0.93	5.63	1.00	5.67	0.96	5.52	1.31	5.45	1.18
Empathy	5.21	0.79	5.21	0.76	5.21	0.81	5.19	0.79	5.19	0.84	5.27	0.95
Social Awareness	5.13	0.92	5.16	0.95	5.14	0.96	5.17	0.89	5.16	1.08	4.99	0.96
Impulsivity (low)	4.69	0.99	4.73	0.96	4.71	0.96	4.68	1.07	4.74	1.32	4.71	0.99
Emotion Perception	4.93	0.82	4.96	0.85	5.00	0.85	4.93	0.85	4.82	0.87	4.96	0.91
Stress Management	4.64	1.02	4.72	1.00	4.74	1.01	4.68	1.05	4.79	1.19	4.73	1.09
Emotion Management	4.97	0.80	4.94	0.85	5.00	0.85	5.06	0.92	5.03	0.83	4.59	1.06
Optimism	5.33	0.96	5.39	0.96	5.41	0.93	5.41	0.90	5.31	1.06	5.13	1.05
Relationships	5.53	0.80	5.63	0.75	5.51	0.87	5.54	0.85	5.50	0.72	5.62	0.92
Adaptability	4.76	0.87	4.78	0.87	4.81	0.91	4.85	0.86	4.94	0.96	4.89	0.97
Assertiveness	4.97	0.95	5.02	0.96	4.98	0.93	5.07	0.91	5.17	0.96	4.72	0.94
Well Being	5.35	0.82	5.41	0.81	5.39	0.84	5.43	0.81	5.28	1.06	5.15	0.92
Self-Control	4.61	0.85	4.67	0.82	4.67	0.84	4.68	0.90	4.75	1.07	4.84	0.86
Emotionality	5.14	0.72	5.17	0.74	5.15	0.75	5.14	0.75	5.10	0.68	5.05	0.85
Sociability	5.02	0.77	5.04	0.81	5.04	0.79	5.10	0.77	5.12	0.88	4.77	0.76
Trait EI	5.01	0.63	5.05	0.64	5.04	0.67	5.07	0.65	5.03	0.79	4.95	0.70

Next two-way ANOVAs were run to first see if birth order and age had an impact on trait EI scores and second to see if birth order and gender had an impact on trait EI scores. There were two birth order groups: first borns and later borns. Age was broken down into three groups: Group 1 (18-29), Group 2 (30-44) and Group 3 (45+). Table 5.4 shows the means and standard deviations for ordinal position, age and trait EI. The results found that birth order and age has no impact on trait EI scores. The second two-way ANOVA explored the impact of birth order and gender on trait EI scores and found no significant difference in scores. The results are displayed in Table 5.5.

Table 5.4
Means and Standard Deviations for Ordinal Position, Age and Trait EI

	First Borns						Later Borns					
	Group 1: 18-29		Group 2: 30-44		Group 3: 45+		Group 1: 18-29		Group 2: 30-44		Group 3: 45+	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Self Esteem	4.93	0.94	5.23	0.89	5.27	0.84	4.91	0.97	5.27	0.84	5.25	0.95
Emotion Expression	4.77	1.23	5.07	1.07	4.96	1.20	4.73	1.26	5.02	1.16	4.84	1.22
Self-motivation	4.60	0.82	5.05	0.75	5.24	0.70	4.59	0.85	5.10	0.76	5.21	0.75
Emotion Regulation	4.19	0.90	4.74	0.86	4.99	0.88	4.26	0.93	4.82	0.87	4.93	0.91
Happiness	5.58	0.95	5.74	0.98	5.76	0.99	5.57	0.99	5.78	0.90	5.80	1.06
Empathy	5.15	0.83	5.28	0.74	5.32	0.76	5.09	0.81	5.26	0.76	5.37	0.73
Social Awareness	4.93	0.90	5.35	0.92	5.37	0.92	4.99	0.93	5.26	0.91	5.32	1.01
Impulsivity (low)	4.42	0.98	4.86	0.95	5.12	0.86	4.41	0.96	4.92	0.90	5.14	0.94
Emotion Perception	4.85	0.84	5.00	0.80	5.07	0.81	4.84	0.88	5.06	0.81	5.01	0.81
Stress Management	4.35	1.00	4.85	1.00	5.14	0.89	4.47	1.04	4.92	0.90	5.00	1.01
Emotion Management	4.87	0.78	5.10	0.79	5.08	0.82	4.86	0.83	5.07	0.84	4.97	0.97
Optimism	5.23	0.91	5.46	0.99	5.45	1.01	5.24	0.98	5.53	0.88	5.48	0.96
Relationships	5.53	0.80	5.61	0.80	5.45	0.76	5.55	0.82	5.64	0.77	5.56	0.80
Adaptability	4.54	0.82	5.02	0.84	4.89	0.89	4.54	0.84	4.99	0.85	5.06	0.92
Assertiveness	4.76	0.92	5.14	0.92	5.30	0.93	4.81	0.94	5.15	0.89	5.23	0.95
Well Being	5.24	0.81	5.48	0.84	5.49	0.80	5.24	0.85	5.53	0.75	5.51	0.87
Self-Control	4.32	0.81	4.82	0.80	5.08	0.76	4.38	0.82	4.89	0.76	5.02	0.80
Emotionality	5.07	0.73	5.24	0.70	5.20	0.75	5.06	0.75	5.24	0.72	5.20	0.72
Sociability	4.85	0.74	5.20	0.75	5.25	0.78	4.89	0.78	5.16	0.77	5.17	0.86
Trait EI	4.84	0.60	5.17	0.61	5.22	0.63	4.86	0.64	5.19	0.61	5.21	0.67

Table 5.5
Means and Standard Deviations for Ordinal Position, Gender and Trait EI

	First Borns				Later Borns			
	Males		Females		Males		Females	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Self Esteem	5.25	0.87	4.89	0.93	5.30	0.85	4.89	0.98
Emotion Expression	4.77	1.15	5.01	1.19	4.80	1.19	4.93	1.25
Self-motivation	4.94	0.80	4.77	0.83	4.98	0.83	4.80	0.86
Emotion Regulation	4.79	0.89	4.20	0.90	4.86	0.88	4.29	0.94
Happiness	5.63	0.97	5.68	0.97	5.71	0.93	5.66	1.00
Empathy	5.13	0.79	5.30	0.78	5.16	0.81	5.25	0.75
Social Awareness	5.24	0.95	5.01	0.86	5.28	0.94	5.01	0.94
Impulsivity (low)	4.85	0.97	4.52	0.98	4.82	1.01	4.61	0.95
Emotion Perception	4.84	0.83	5.02	0.81	4.94	0.89	4.98	0.80
Stress Management	4.96	0.92	4.31	1.01	4.97	0.92	4.46	1.04
Emotion Management	5.10	0.81	4.84	0.77	5.11	0.85	4.80	0.86
Optimism	5.32	0.95	5.34	0.97	5.44	0.89	5.33	1.01
Relationships	5.41	0.81	5.65	0.77	5.50	0.82	5.68	0.76
Adaptability	4.86	0.83	4.64	0.89	4.92	0.88	4.68	0.88
Assertiveness	5.16	0.93	4.77	0.93	5.21	0.85	4.79	0.99
Well Being	5.40	0.81	5.30	0.84	5.48	0.77	5.29	0.89
Self-Control	4.87	0.81	4.35	0.81	4.88	0.80	4.45	0.83
Emotionality	5.04	0.74	5.24	0.70	5.10	0.77	5.21	0.71
Sociability	5.17	0.79	4.87	0.72	5.20	0.77	4.87	0.80
Trait EI	5.08	0.65	4.93	0.60	5.13	0.65	4.94	0.65

A two-by-two between groups analysis of covariance was conducted to assess the interaction of birth order and gender in trait EI scores when controlling for age. The results suggest that when adjusting for age, there is no interaction effect between birth order and gender in any of the trait EI scales. The means and standard deviations are presented in Table 5.6.

Table 5.6

Means and Standard Deviations

	Males												Females											
	Ordinal position												Ordinal position											
	1st (n=338)		2nd (n=252)		3rd (n=127)		4th (n=53)		5th (n=25)		6th (n=15)		1st (n=3334)		2nd (n=244)		3rd (n=115)		4th (n=41)		5th (n=11)		6th (n=10)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Self Esteem	5.26	0.87	5.26	0.82	5.33	0.86	5.34	0.89	5.33	0.96	5.24	0.92	4.90	0.93	4.90	0.94	4.92	0.98	4.97	1.02	4.28	1.23	4.42	1.30
Emotion Expression	4.78	1.16	4.75	1.23	4.87	1.15	4.91	1.11	5.02	1.02	4.19	1.32	5.01	1.19	4.97	1.25	4.90	1.24	4.86	1.33	4.54	1.14	4.53	1.57
Self-motivation	4.95	0.81	4.95	0.82	5.01	0.88	5.05	0.70	4.93	0.92	4.89	0.86	4.75	0.83	4.78	0.83	4.82	0.94	4.79	0.73	4.27	1.03	4.88	0.67
Emotion Regulation	4.81	0.89	4.79	0.88	4.80	0.88	4.99	0.90	5.02	0.85	5.10	0.99	4.19	0.89	4.32	0.93	4.22	0.97	4.24	0.84	4.03	1.34	4.46	0.62
Happiness	5.64	0.98	5.75	0.90	5.59	0.95	5.77	0.92	5.75	1.07	5.69	1.02	5.68	0.97	5.74	0.96	5.70	1.02	5.51	1.01	5.00	1.70	5.10	1.41
Empathy	5.14	0.79	5.11	0.80	5.19	0.81	5.26	0.81	5.27	0.80	5.19	1.06	5.30	0.79	5.30	0.71	5.22	0.81	5.11	0.78	5.00	0.97	5.40	0.84
Social Awareness	5.26	0.95	5.26	0.94	5.31	0.93	5.27	0.92	5.39	0.98	5.10	0.90	5.01	0.87	5.05	0.94	4.95	0.96	5.02	0.84	4.60	1.17	4.89	1.09
Impulsivity (low)	4.86	0.98	4.81	0.96	4.81	0.99	4.88	0.97	4.80	1.29	4.85	1.29	4.50	0.97	4.63	0.93	4.62	0.92	4.37	1.11	4.53	1.46	5.07	0.57
Emotion Perception	4.84	0.83	4.86	0.90	5.04	0.85	4.95	0.90	4.94	0.81	5.01	1.08	5.02	0.81	5.03	0.78	4.95	0.85	4.86	0.79	4.46	0.94	4.92	0.68
Stress Management	4.98	0.92	4.96	0.91	4.92	0.99	5.04	0.86	5.10	0.86	5.07	0.97	4.30	1.02	4.49	1.04	4.57	0.99	4.16	1.03	4.08	1.31	4.20	1.16
Emotion Management	5.11	0.80	5.07	0.81	5.15	0.84	5.21	0.94	5.17	0.81	4.63	1.19	4.84	0.77	4.77	0.86	4.84	0.84	4.87	0.86	4.77	0.86	4.57	0.98
Optimism	5.34	0.95	5.40	0.89	5.44	0.91	5.66	0.77	5.48	0.96	5.12	0.95	5.34	0.97	5.38	1.02	5.41	0.93	5.10	0.96	4.91	1.27	5.19	1.28
Relationships	5.43	0.81	5.50	0.79	5.47	0.87	5.57	0.85	5.46	0.84	5.63	0.93	5.65	0.77	5.78	0.69	5.57	0.86	5.48	0.86	5.56	0.37	5.62	1.00
Adaptability	4.87	0.83	4.86	0.85	4.92	0.90	5.01	0.89	5.20	0.84	4.97	1.10	4.63	0.89	4.69	0.89	4.68	0.91	4.59	0.75	4.29	0.97	4.80	0.83
Assertiveness	5.17	0.94	5.22	0.85	5.16	0.88	5.21	0.83	5.35	0.86	5.00	0.68	4.78	0.93	4.80	1.01	4.77	0.92	4.88	0.97	4.71	1.11	4.33	1.19
Well Being	5.41	0.81	5.47	0.75	5.45	0.80	5.61	0.74	5.52	0.88	5.35	0.82	5.31	0.84	5.34	0.85	5.34	0.87	5.19	0.87	4.72	1.30	4.90	1.07
Self-Control	4.88	0.82	4.85	0.79	4.86	0.79	4.97	0.77	4.97	0.91	5.01	0.94	4.33	0.80	4.48	0.81	4.47	0.83	4.26	0.87	4.22	1.30	4.58	0.74
Emotionality	5.05	0.74	5.05	0.78	5.14	0.75	5.17	0.79	5.17	0.70	5.01	0.88	5.25	0.70	5.27	0.68	5.16	0.76	5.08	0.70	4.89	0.63	5.12	0.89
Sociability	5.18	0.78	5.18	0.77	5.21	0.77	5.23	0.77	5.30	0.81	4.91	0.66	4.88	0.72	4.87	0.72	4.85	0.76	4.92	0.76	4.69	0.97	4.60	0.91
Trait EI	5.09	0.65	5.10	0.64	5.14	0.66	5.21	0.65	5.21	0.67	5.05	0.71	4.93	0.60	4.97	0.63	4.94	0.67	4.85	0.59	4.60	0.92	4.82	0.74

5.2.4 Discussion

The present study found that there is no relationship between ordinal position and trait EI. This large-scale trait EI study investigated the relationship between ordinal position and 20 trait EI variables including the 15 facets of the trait, the four broad factors and a global trait EI score. Two analyses were conducted, first to compare first borns with later borns. This analysis grouped together participants belonging to every ordinal position except first borns. By using an independent samples t-test, the two groups were compared to assess whether there was a significant difference between first and later borns in any of the in 20 different trait EI scores. Results found that there was no significant difference in scores between first and later borns in any of the trait EI scores.

The second analysis compared the ordinal positions against each other so that trait EI scores were compared across the six groups. By doing so differences could be assessed between the groups on their scores to find if for example second borns scored higher or lower than fourth borns. The ANOVA found that there was no significant difference between the six groups on any of the trait EI scores. Overall, this study strongly suggests that ordinal position has no effect on trait EI.

While the sample size was very large, one potential limitation of this study was the birth order information that the TEIQue provides. Unlike the BOQ, used in earlier studies in this thesis, the TEIQue demographics provide us with limited information about birth order. Respondents are asked to tick a box representing their ordinal birth position. Therefore the birth order information can only tell us if the participant is a *first, second, third* etc, born. While this information is relevant to the current study and cam be used as an independent variable it only provides data about the order in which a sibling is born. The independent variable is therefore ordinal position without

consideration to a sibling's absolute birth order. For example, all only children were included with first borns; while only children are technically the first child born they do fall into this category. However, this means that first borns are not the same as oldest borns as oldest borns reflect the presence of younger siblings. The following study will account for these factors by using the BOQ in order to ascertain if there are birth order differences found when using the TEIQue inventory.

5.3 Study 9: Trait EI and Birth Order

5.3.1 Introduction

The current study examines the relationship between trait EI and birth order using the same TEIQue inventory used in Study 8. This study differs from Study 8 in that it defines birth order as a more specific variable than ordinal position. In this study birth order is defined as *only, oldest, middle* or *last born*. By differentiating between ordinal positions, more relationships can be explored such as how middle children differ in trait EI from first and last borns, or how individuals with siblings differ from only children. It is a common perception that siblings have a big influence on an individual's upbringing and, in turn, on their personality. According to Sulloway (1995), birth order differences are a result of Darwinian theory that siblings need to differentiate from each other in order to survive within their family niche. This idea of niche partitioning led Sulloway to conclude that individuals differ in personality partly as a result of their birth order. He applies this idea to the Big Five as discussed earlier in this thesis. As trait EI shares some overlap with the Big Five, this thesis asserts that like the Big Five, trait EI will be related to birth order.

The current study hypothesizes that individuals with siblings will score higher

on all facets of Emotionality (emotion-perception, empathy, emotion expression, and relationships) than individuals who are only children. For most individuals, the majority of social interaction in their early years is with their siblings. In order to survive within the family model individuals must learn how to interact and understand their siblings and their varying emotions. Therefore it is predicted that individuals with siblings would score higher in these facets, as these traits were necessary to get along and survive in their family unit.

The current study predicts that middle borns will score significantly different than first and last borns on all facets of trait EI and global trait EI. This hypothesis is based on the idea that siblings aim to differentiate amongst themselves. While the first born usually have their role as the first and leader of their sibship group, youngest borns have their distinct roles as well. It is the middle child that needs to find their unique place in the sibship group in order to receive the attention and parental resources they require. For these reasons, the current study predicts that middle children aim to be different than their older and younger sibling and this will be reflected in their trait EI scores. The identity of the middle child will be discussed in more detail in Chapter 6. Similar to Study 7, the current study predicts that first borns and only children will score higher on Self-control and the related facets than middle and younger borns. Finally, this study predicts that individuals with siblings will score higher on the relationships facet of trait EI than only children as they develop in a house with the potential to develop more relationships in their shared environment than only children. The hypotheses for Study 9 are presented below:

H1: First and last borns will score more similar and distinctly different than middle borns on global trait EI.

H2: First borns and only children will score higher on Self-control and low impulsivity (high impulse control).

H3: Individuals with siblings will score higher on relationships than only children.

5.3.2 Method

5.3.2.1 Participants

A total of 236 adult individuals (Males=57, Females=179) completed the materials. The sample ranged in age from 18 to 64 years and the average age was 25.96 years (*SD*=8.42). Participants were recruited through friends, families and social networking sites and asked to complete questionnaires that were available both online and in paper formats. They were asked to complete a questionnaire relating to birth order and personality traits and were debriefed in more detail upon completion. Participants were asked to place themselves in one of five birth order groups: *only, oldest, middle, last and other*. They were instructed that the category *other* referred to those who do not fit into any one category. Possible reasons for this include belonging to a multiple birth or being part of a blended family (half and step siblings not growing up in the same house). Those ticking the *other* box (n=3) were removed from the sample in order to achieve a sample of participants with biological siblings.

The number of participants belonging to each one of the remaining four birth order groups is represented in Table 5.6. There were a total of 39 only children and 197 individuals with siblings. The number of siblings each participant reporting having is represented in Table 5.7 and ranged in size from zero to nine. The number of siblings growing up in the same house as the participant ranged in size from zero to seven as represented in Table 5.8.

Table 5.7
Distribution of Birth Order Groups

Only Children	Oldest Children	Middle Children	Youngest Children
39	90	25	82

Table 5.8
Number of siblings

0	1	2	3	4	5	6	7	8	9
35	112	63	17	3	2	2	1	0	1

Table 5.9
Number of siblings growing up in the same house the majority of the time

0	1	2	3	4	5	6	7	8	9
46	115	52	17	0	2	2	1	0	0

5.3.2.2 Materials

Trait Emotional Intelligence Questionnaire (TEIQue; Petrides, 2009). As discussed in Section 4.2.2.2.

Birth Order Questionnaire As discussed in Section 4.2.2.2.

5.3.3 Results

An independent samples t-test compared only children and individuals with siblings in trait EI scores. Results found that there was no significant difference in any of the trait EI scores between individuals with siblings and individuals without siblings. Results are displayed in Table 5.10.

Table 5.10
T-test results for Birth Order and Trait EI

	M	*SD*	*t(234)*	*r*
Self-esteem			0.32	0.02
Only Child	4.98	0.77		
Siblings	4.93	0.86		
Emotion Expression			-1.02	0.07
Only Child	4.60	1.11		
Siblings	4.81	1.19		
Self-motivation			-0.26	0.02
Only Child	4.64	0.62		

Siblings	4.68	0.73		
Emotion Regulation			0.62	0.04
Only Child	4.35	0.75		
Siblings	4.26	0.81		
Happiness			-0.78	0.05
Only Child	5.43	0.90		
Siblings	5.56	0.98		
Empathy			-0.38	0.02
Only Child	5.23	0.86		
Siblings	5.28	0.75		
Social awareness			-0.03	0.02
Only Child	4.87	0.89		
Siblings	4.88	0.84		
Impulsivity			-0.94	0.06
Only Child	4.32	0.94		
Siblings	4.46	0.89		
Emotion perception			-1.80	0.12
Only Child	4.75	0.78		
Siblings	4.99	0.77		
Stress management			-0.31	0.02
Only Child	4.27	0.95		
Siblings	4.32	0.89		
Emotion management			-0.88	0.98
Only Child	4.80	0.84		
Siblings	4.93	0.82		
Optimism			-0.67	0.04
Only Child	5.11	1.07		
Siblings	5.22	0.96		
Relationships			-1.27	0.08
Only Child	5.35	0.83		
Siblings	5.52	0.74		
Adaptability			0.06	0.00
Only Child	4.36	0.87		
Siblings	4.35	0.86		
Assertiveness			-0.19	0.01
Only Child	4.57	0.93		
Siblings	4.60	0.85		
Well being			-0.47	0.03
Only Child	5.17	0.76		
Siblings	5.24	0.80		
Self-control			-0.31	0.02
Only Child	4.31	0.68		
Siblings	4.35	0.67		
Emotionality			-1.42	0.09
Only Child	4.98	0.71		
Siblings	5.15	0.67		
Sociability			-0.43	0.03
Only Child	4.75	0.72		

Siblings	4.80	0.71		
Global trait EI			-0.83	0.05
Only Child	4.78	0.46		
Siblings	4.85	0.55		

A one-way analysis of variance was conducted to compare the mean scores of the four birth order groups and trait EI facets, factors and global trait EI. Results found no significant differences in scores between the groups, indicating that there is no relationship between birth order and trait EI. The mean scores and standard deviations are displayed in Table 5.11.

Table 5.11
Means and Standard Deviations for Birth Order and Trait EI

	Only Child		Oldest Child		Middle Child		Youngest Child	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Self Esteem	4.98	0.77	4.93	0.83	4.99	1.02	4.92	0.84
Emotion Expression	4.60	1.11	4.87	1.21	5.00	1.23	4.68	1.14
Self-motivation	4.64	0.62	4.66	0.73	4.90	0.85	4.62	0.69
Emotion Regulation	4.35	0.75	4.27	0.85	4.32	0.74	4.23	0.78
Happiness	5.43	0.90	5.53	1.10	5.72	1.11	5.54	0.78
Empathy	5.23	0.86	5.27	0.77	5.23	0.67	5.31	0.76
Social Awareness	4.87	0.89	4.86	0.97	4.81	0.71	5.31	0.76
Impulsivity (low)	4.32	0.94	4.58	0.83	4.34	1.12	4.37	0.86
Emotion Perception	4.75	0.78	5.05	0.75	5.05	0.81	4.91	0.78
Stress Management	4.27	0.95	4.31	1.02	4.28	0.93	4.33	0.70
Emotion Management	4.80	0.84	4.95	0.88	4.80	0.90	4.95	0.73
Optimism	5.11	1.07	5.22	1.02	5.28	1.02	5.21	0.89
Relationships	5.35	0.83	5.53	0.80	5.60	0.67	5.48	0.70
Adaptability	4.36	0.87	4.40	0.92	4.11	0.93	4.38	0.78
Assertiveness	4.57	0.93	4.68	0.97	4.55	0.76	4.52	0.71
Well Being	5.17	0.76	5.23	0.85	5.33	0.91	5.22	0.72
Self-Control	4.31	0.68	4.39	0.72	4.31	0.68	4.31	0.63
Emotionality	4.98	0.71	5.18	0.70	5.22	0.67	5.09	0.64
Sociability	4.74	0.72	4.83	0.82	4.72	0.59	4.79	0.59
Trait EI	4.77	0.46	4.88	0.61	4.87	0.61	4.82	0.45

Two Pearson product correlation analyses were conducted; the first to explore the correlation between the number of siblings and trait EI scores and the second sought to explore the correlation between the number of siblings growing up in the same house

together. This analysis is similar to Section 4.2.3, however this study utilizes the full TEIQue with all 15 facets. The results are displayed in Table 5.12 and found that the total number of siblings is not correlated to trait EI. Results did however show that emotion expression, emotion perception, optimism, emotionality and global trait EI are all positively correlated to the total number of siblings growing up in the same house the majority of the time. More specifically, this finding suggests that the more siblings you have growing up with you the higher your emotion expression, emotion perception, optimism, emotionality, and global trait EI scores. This finding also highlights the differences between having siblings that grow up in the same house together for the majority of their upbringing and having siblings that live outside the house.

Table 5.12
Correlations between the number of siblings and trait EI

	Total Number of Siblings (n=236)		Total Number of siblings growing up in the same house (n=235)	
	r	*p*	*r*	*p*
Self esteem	0.01	0.88	0.05	0.44
Emotion expression	0.07	0.28	0.18**	$p \leq .01$
Self-motivation	0.05	0.41	0.04	0.53
Emotion regulation	0.05	0.44	0.06	0.37
Happiness	0.07	0.26	0.05	0.42
Empathy	0.06	0.39	0.11	0.08
Social awareness	0.06	0.37	0.10	0.14
Impulsivity	-0.01	0.85	0.03	0.66
Emotion perception	0.08	0.20	0.18**	$p \leq .001$
Stress management	0.05	0.44	0.06	0.36
Emotion management	0.01	0.88	0.10	0.11
Optimism	0.15*	0.02	.168**	$p \leq .01$
Relationships	0.10	0.12	0.08	0.19
Adaptability	0.02	0.74	0.03	0.66
Assertiveness	0.01	0.87	0.03	0.61
Well being	0.09	0.15	0.11	0.10
Self-control	0.04	0.57	0.06	0.34

Emotionality	0.10	0.13	0.19**	$p \leq .001$
Sociability	0.03	0.63	0.09	0.16
Global trait EI	0.09	0.18	0.14*	$p \leq .05$

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the .05 level (2-tailed)

As there were only five participants with more than three siblings, both analyses were run again with those participants removed as these participants represented potential outliers. Again, there was no significant correlation between the number of siblings and the trait EI scores as displayed in Table 5.13. With the five individuals removed there were some differences in the correlations between trait EI scores and number of siblings growing up together. This analysis found that emotion expression [r=.14, n=230, p<.05] and optimism [r=.14, n=230, p<.05] both positively correlated with the total number of siblings growing up in the same house together; all results are displayed in Table 5.13.

Table 5.13
Correlations between the number of siblings and trait EI

	Total Number of Siblings (n=230)		Total Number of siblings growing up in the same house (n=230)	
	r	*p*	*r*	*p*
Self esteem	-0.04	0.52	0.01	0.84
Emotion expression	0.05	0.49	0.14*	$p \leq .05$
Self-motivation	0.19	0.77	0.00	0.94
Emotion regulation	0.17	0.81	0.03	0.66
Happiness	0.04	0.51	0.04	0.51
Empathy	0.03	0.65	0.08	0.21
Social awareness	0.01	0.82	0.04	0.57
Impulsivity	-0.01	0.91	0.03	0.61
Emotion perception	0.04	0.53	0.13	0.06
Stress management	-0.03	0.61	-0.02	0.78
Emotion management	-0.01	0.87	0.10	0.15
Optimism	0.10	0.14	0.14*	$p \leq .05$

Relationships	0.06	0.34	0.03	0.6
Adaptability	-0.04	0.59	-0.07	0.29
Assertiveness	-0.10	0.90	0.22	0.74
Well being	0.42	0.52	0.08	0.24
Self-control	-0.01	0.86	0.02	0.78
Emotionality	0.06	0.38	0.13	0.53
Sociability	0.00	0.98	0.06	0.36
Global trait EI	0.03	0.69	0.08	0.22

* Correlation is significant at the 0.05 level (2-tailed)

5.3.4 Discussion

The current study found no significant differences in trait EI scores between the birth order groups. In contrast to the hypotheses, only children did not score significantly different than individuals with siblings and there was no difference in scores between the four birth order groups. This between family design was the first of its kind to use the TEIQue in combination with a comprehensive birth order questionnaire in order to explore birth order effects. The data suggests that overall; birth order has no impact on trait EI.

5.4 General Discussion

While the findings contradict the original hypotheses they do confirm findings from Study 7. Unlike Study 7, the present study was able to examine not only global trait EI and the four broad factors but also the 15 facets. Sulloway (1995) had difficulty clearly defining the relationship between both extraversion and neuroticism and birth order, which he argues, is a result of the discrepant facets included in these traits. He argues that birth order effects are predicted to be higher on some facets and lower on others, which leads to inconclusive results on the overall trait. The new information collected from Studies 8 and 9 gives us the opportunity to look at the facets that the factors comprise. Unlike Sulloway's theories, this information provides a more

definitive argument that birth order is not related to the personality trait emotional intelligence.

One potential limitation of the study was the difference in size between the different birth order groups. Perhaps if the only children group were of a larger size, significant results would become apparent. Chapter 6 corrects the difference in size of the birth order groups by gathering data from a group of sibling sets. While this within family design cannot gather any information on only children, it can however compare siblings within a family.

5.5 Chapter Summary and a Look Ahead

The two studies in this chapter revealed that there are no birth order effects on trait EI when using the TEIQue in two large sample groups. The studies found that ordinal position has no effect on trait EI and also found that the number of siblings an individual has does not have an effect on trait EI. The findings support the results found in Chapter 4, which utilised a shorter instrument (TEIQue-SF) to measure the trait. However, a positive correlation was found between two of the facets of trait EI, emotion expression and optimism, and the number of siblings growing up in the same house together. This suggests that it is not where you fall in the family line that is related to facets of trait EI, but rather that the more siblings you lived with most of your upbringing, the higher your emotion expression and optimism. Overall, the findings suggest that even with different sample sizes and varying methodologies, birth order differences in trait EI are non-existent in between family designs.

The studies discussed in both Chapters 4 and 5 explored potential birth order effects in between family designs. The following chapter examines the relationship between birth order and trait EI along with the Big Five personality traits in a within

family design.

Chapter 6: Birth Order & Personality: A within family design

6.1 Study 10: Introduction

When embarking on birth order research one must chose which type of design is most fitting for the variables of interest and conditions of the procedure. Previous studies covered in this thesis utilised a between family design and looked at birth order effects across individuals in a population. This chapter marks a transition in methodology with its use of a within family design.

Part of the conflicting evidence on the relationship between birth order and personality is attributed to differences in methodology. For example, findings from between family designs differ greatly from within family designs. The main difference in these two methodologies is that between family designs often cannot account for parental personality, sibship size and SES, all of which are confounding variables that can affect the data and the findings (Paulhus et al, 1999). In line with Sulloway's predictions, Paulhus et al., (1999) found that first borns scored higher on conscientiousness while later borns scored higher on openness to experience and agreeableness in a within family design. Paulhus et al (1999) assert that research findings contradicting Sulloway's model are a result of poor experimental designs such as between family designs or not using psychometrically valid measures of the traits. It is for this reason that within family designs are considered to be more psychometrically valid (Rodgers, 1988) as this method provides the control for potential confounding variables (Beck et al., 2006; Ernst & Angst, 1983).

The aim of Study 10 is to examine the relationship between birth order and both the Big Five (Neuroticism, Extraversion, Openness to experience, Conscientiousness and Agreeableness) and Trait EI in a within family design. Studies 6, 7, 8 and 9

examined the relationship between birth order and these dependent variables across a group of individuals, whereas this study utilises sets of siblings in order to see how this relationship exists within a family.

In order to conduct this within family design, sets of siblings belonging to different families were recruited and all asked to complete the same questionnaires. By using sets of three sibling families each sibling set consisted of a first born, middle born and last born. This differs from previous research that often focuses on differences between first borns and last borns. In these studies, last borns consist of any sibling born after the first born; the lumping together of these distinct ordinal positions is often considered a flaw in birth order research (Sampson, 1965). Middle born children are found to differ in personality to their older and younger siblings (Schacter et al, 1978; Sulloway, 2001) and should therefore stand alone in their own category.

The current study therefore included middle borns as a separate category to test Sulloway's theory that middle borns are unique in that they share parental resources with their siblings for the longest period of their lives. Unlike middle children, first borns and last borns are likely to experience periods of their lives as only children in the family (Hertwig, Davis & Sulloway, 2002). For first borns, this time is before their younger siblings are born, whereas for last borns this time happens when their older siblings move out of the house. Middle borns will experience a time being a last born but they are still sharing parental resources with their older sibling and will never hold all of their parent's attention. According to previous studies, an interesting trend emerges once middle borns are placed in their own category; personality differences are found between middles and first borns and middles and last borns (Schachter et al, 1978). This pattern is referred to as the zigzag pattern in birth order research

(Sulloway, 1996). Sulloway explains this pattern by suggesting that first and last borns have less need to compete over parental resources and want to differentiate themselves from the next line. One aim of the current study is to demonstrate that first and last borns are more similar in their Big Five scores than they are to their middle sibling. In addition to investigating patterns in the relationship between birth order and personality, the current study follows the hypotheses made in the between subjects study from Chapter 4 with regards to Sulloway's theory on the Big Five.

This study is the first of its kind to examine birth order and trait EI in a within family sample. Trait EI will be assessed by the TEIQue-SF, which generates one global trait EI score as well as scores on the four broad trait EI factors (well-being, sociability, self-control and emotionality). It is hypothesized that youngest borns will score higher in trait EI than middle and first and that middle borns will score higher than first borns.

This prediction is based on Sulloway's idea that there is a survival of the fittest mentality to siblings. Youngest borns have to compete for parental resources against more individuals while at the same time find their niche in the family. In order to do these things while maintaining peace among both their siblings and their peers they need to be in tune with their own emotions and those of the other people in their family unit. Youngest borns enter the world into a family consisting of four (as defined in this study) individuals, from an early age they must interpret how their emotions affect others around them and vice versa. Therefore, in order to maintain harmonious relationships between their family members, youngest borns must utilize characteristics associated with high trait EI. Unlike the between family studies of trait EI discussed in this thesis, this study cannot make comparisons between families differing in sibship size and will look instead at birth order patterns in three family sibling sets. This study

predicts the following hypotheses:

H1: First borns will score higher in conscientiousness than middle and last borns

H2: Middle borns will score higher in neuroticism than first and last borns

H3: Last borns will score higher in agreeableness and openness to experience than first borns

H4: No significant relationship will be found between birth order and extraversion

H5: Last borns will score higher on trait EI and its factors than first and middle borns

6.2 Method

6.2.1 Participants

Forty-two sets of three sibling families (56 males and 42 females) completed the measures for this study. All sibling sets where biologically related as all step and half siblings were removed from the final sample (n=12 sibship sets). Participants represented a range of cultural backgrounds; the majority of participants were of British origin, other nationalities included Greek, Swedish, American, Indian and Singaporean. The mean age for the sample was 24.7 yrs (SD=5.6yrs).

6.2.2 Materials

Birth Order Questionnaire As described in detail in Section 4.2.2.2

International Personality Item Pool (IPIP; Goldberg, 1999). As described in detail in Section 1.4.1.6.2. The Cronbach's alpha in this study is presented in Table 6.1.

Table 6.1

Reliability of IPIP Scales

Factor	Cronbach's Alpha
N	0.79
E	0.87
O	0.76
A	0.75
C	0.79

Trait Emotional Intelligence Questionnaire- Short Form (TEIQue-SF; Petrides 2009; see also Cooper and Petrides, 2010). As discussed in detail in Section 1.4.2.4. Cronbach's alpha in this study was .86.

6.2.3 Design and Procedure

Families were recruited through friends, families and social networking sites and asked to complete questionnaires that were available both online and in paper formats. Each participant was assigned a unique identification code that corresponded to their siblings in order to keep responses anonymous, as well as track and maintain sets of siblings. Participants were asked to complete a questionnaire relating to birth order and personality traits and were debriefed in more detail upon completion.

6.3 Results

A repeated-measures ANOVA was conducted to investigate significant differences in scores between the three birth order groups. The means and standard deviations for the three birth order groups and the personality traits are shown in Table 6.2. The results found no significant differences in scores for Extraversion, Openness to experience or Agreeableness. A significant difference in scores was found for Conscientiousness [Wilk's Lambda=.84, $F(2,40)=3.87$, $p<.05$, multivariate partial eta

squared=.16]. Post hoc tests using LSD found that first borns scored significantly higher than last borns on this trait and there were no significant differences found between middle children and either their younger or older siblings. A significant difference was also found for Neuroticism [Wilk's Lambda= .83, $F(2,40)=4.14$, $p<.05$, multivariate partial eta squared= .17]. Post hoc tests using LSD revealed that middle borns scored significantly lower than both first and last borns on this trait. No significant difference in scores was found for global trait EI or the four trait EI factors.

Table 6.2
Means and Standard Deviations for Big Five and Trait EI

	First Born		Middle Born		Last Born	
	M	*SD*	*M*	*SD*	*M*	*SD*
Extraversion	3.36	0.71	3.55	0.78	3.44	0.62
Neuroticism	2.70	0.64	2.40	0.52	2.65	0.61
Openness	3.60	0.84	3.76	0.57	3.67	0.63
Agreeableness	3.60	0.56	3.65	0.53	3.45	0.66
Conscientiousness	3.55	0.72	3.40	0.61	3.16	0.55
Global Trait EI	5.05	0.75	5.10	0.69	4.93	0.52
Well Being	5.54	0.91	5.84	0.67	5.60	0.78
Self Control	4.54	0.87	4.80	1.03	4.43	0.96
Emotionality	5.08	1.01	4.91	1.06	4.95	0.93
Sociability	4.84	0.97	4.93	0.99	4.68	0.87

6.4 Discussion

The purpose of this study was to examine birth order effects on personality in a within family design. Based on Sulloway's (1996) model, it was hypothesized that birth order effects would be found in neuroticism, conscientiousness, agreeableness and openness to experience. Birth order effects on trait EI were expected with younger borns and middle borns hypothesized to score higher on trait EI than first borns. Results from the study found that birth order effects were evident in two of the six traits of interest. Significant relationships between both neuroticism and conscientiousness and birth order were found. More specifically the study found that oldest borns scored

significantly higher than their younger siblings in conscientiousness. A zigzag pattern emerged in the neuroticism trait with middle borns scoring significantly lower than first and last borns respectively. No significant relationships were found between birth order and trait EI.

6.4.1 Birth Order and the Big Five

The mean Big Five scores for each of the sibling sets were compared using a within family design. As hypothesized, first borns are more conscientious than their younger siblings. This finding supports Sulloway's model and other birth order research and can be explained by Sulloway's notion that first borns aim to please their parents. By being more conscientious, first borns are conforming to their parent's ideals and their niche within their family is to please and excel the areas that their parents want them to, this could diligence in school work, music practice etc.

Birth order differences in neuroticism found that oldest and youngest borns score higher than their middle born sibling. This finding can be explained by Sulloway's theory of deidentification. This theory states that siblings often find their place within the family structure by being different (de-identifying) from their peers. According to the zigzag pattern produced in this trait it appears that middle borns are standing out from their siblings by being less neurotic than them. This finding is particularly interesting in relation to Sulloway's (1996) family model where he has some difficulty producing a definitive theory on the relationship between neuroticism and birth order. Sulloway's difficulty is due to the different facets that make up neuroticism. On one hand, he believes that first borns are more anxious than later borns on should score higher, on the other he argues that later borns are more self conscious, another facet of the trait. One would then expect first and last borns to yield similar

scores on neuroticism, which is evident in the current study (First borns M=2.7; Last borns M=2.65). This pattern also lends support to the hypothesis that oldest and youngest borns are more similar than their middle sibling. This finding also demonstrates the importance of creating a separate category for middle borns in birth order research. Without the inclusion of a middle born category this birth order effect could disappear by combining middle borns into a larger category labelled as later borns.

While this study predicted that agreeableness and openness to experience would be related to last borns, no such relationship was found. This finding contradicts the between family design in Study 6 that shows that later borns are more open to experience. One explanation for this finding can be attributed to the different facets that make up these two traits. The IPIP produces global scores for each of the Big Five personality traits, future research could include the use of a within family design and a more thorough measure of the Big Five traits that included the different facets.

Additionally, although the ANOVA's revealed the differences in mean scores were not significant for either agreeableness or openness to experience, it is interesting to note that on both traits middle children scored numerically higher. While 42 sibling sets provides an adequate sample size, one could speculate that these mean differences become significant if the design was to be repeated in a larger set of siblings.

6.4.2 Birth Order and Trait EI

This study was the first of its kind to study birth order effects on trait EI in a within family design. Analyses were run on global trait EI scores as well as on the four trait EI factors (well being, sociability, emotionality and self control); no significant differences were found. Findings suggest that there is no relationship between birth

order and trait EI and are inline with the results found in Studies 7, 8, and 9. This study hypothesised there to be a positive correlation between trait EI and birth order with trait EI scores increasing with the sibling's ordinal positions.

Overall, the findings in Study 10 replicate those in the between-family designs of Studies 7, 8 and 9, suggesting that regardless of the design and sample size there is no relationship between birth order and trait EI or any of its four factors. One advantage of the current study was the sample size consisting of 42 biologically related sibship sets and three identical birth order groups. This within-family design allows us to speculate that regardless of the type of experimental design, there is no relationship between birth order and trait EI or its four factors. The lack of evidence for the trait EI results also suggests that this variable lies outside of the Five Factor Model and also lends support for the idea that trait EI is not equivalent to the Big Five (Petrides, 2010).

6.5 Chapter Summary & A Look Ahead

The findings of this chapter suggest that there is a relationship between birth order and both conscientiousness and neuroticism, with first borns scoring higher than last borns in neuroticism and middle borns scoring lower than first and last borns in conscientiousness. These findings differ from the original hypotheses in this study as well as the results found in Study 6 (Chapter 4). The conclusion for these differences is argued to be based on the within family design used in this Study as opposed to the between family study used in Chapter 4. This chapter also included a final study on the relationship between birth order and trait EI in a within family design. The results in this study lend additional support for the findings in Chapters 4 and 5 that birth order does not have an effect on trait EI scores. The four trait EI studies in this thesis differed

in their methodologies, yet they all produce similar findings. The overall conclusion from the studies produced in this thesis is that there is no relationship between trait EI and birth order regardless of study design. The examination into the links between birth order and trait EI is a novel endeavour and it constitutes a significant strength of this thesis, which is the first to look systematically and extensively into this topic.

The final chapter in this thesis reviews the studies presented and evaluates the findings. The results are examined in two parts: the Big Five studies and the trait EI studies. This chapter will also discuss the potential limitations of the studies and the future direction of research into birth order and personality.

Chapter 7: Review and Evaluation of Research

7.1 Introduction

This thesis explored the relationship of birth order with the Big Five personality theory and trait EI through a series of ten related studies and employed several different research designs. Birth order is a popular topic in many arenas, as people aim to establish links between this concept and a variety of dependent variables. The impact of birth order on personality is not a new topic of exploration. One of the reasons it continues to generate such interest is because of general inconsistency in the findings. The aim of this thesis was to account for some of the limitations in previous literature on birth order and the Big Five and to provide new insights into the relationship between birth order and trait EI.

7.1.1 Birth order and the Big Five

The relationship between birth order and the Big Five was examined through various research designs. First previous research on the relationship between the variables was explored in a systematic manner through a set of meta-analyses. Five separate meta-analyses were run examining the relationship between birth order and each of the Big Five independently. The rationale is that each study on birth order and personality may not necessarily examine all five dependent variables; for example Study 5 found 15 relevant studies on the relationship between birth order and conscientiousness while Study 4 found five relevant studies on the relationship between birth order and openness. Many of the hypotheses in this thesis were supporting Sulloway's claims and his 1995 meta-analysis; Chapter 3 aimed to continue on in his research and considered the inclusion of all relevant research conducted after his meta-analysis. Overall, the five meta-analyses found no significant relationship between

birth order and the Big Five. While these studies did not support the findings of Sulloway (1995), they did support the work of Ernst and Angst (1983) who claim through their own set of meta-analyses that contradictions in research on birth order effects are attributed to differences in methodology.

The exhaustive literature search that was conducted in preparation for the meta-analysis directly supports Ernst and Angst's discussions about the various forms of methodology found in birth order research. These differentiations between studies are categorized mainly by varying sample groups and methodologies. Like many forms of research there is no one set of rules for which participants should and should not be included in a sample size. Each study in this thesis included adults and biological siblings in order to control for cofounding effects such as age and adoption. However, reviews of previous literature vary on the parameters set for their sample group and in some instances these potential additional variables are necessary for the study and others the authors are not clear on the criteria for inclusion. More importantly for the terms of the meta-analyses, it was evident that there is no agreed upon assessment to measure the Big Five and while many employed the NEO-PI-R, the works of 23 studies (Badger & Reddy, 2009; Healy, 2008; Healy & Ellis, 2007; Paulhus, Trapnell & Chen, 1999) did not cite any form of personality measurement.

The next set of studies presented in this thesis was a collection of experimental designs aimed to account for methodological issues in previous research. In Study 6, the relationship between birth order and the Big Five was assessed in a between-family design. A very thorough survey on birth order and related socio-demographic variables (BOQ) was developed for this thesis in order to attain the maximum amount of information regarding ordinal position and upbringing. The goal of the BOQ was to

gather more detailed information on birth order than previous studies had considered such as siblings gender and age spacing, as well as the number of siblings growing up in a house together. While the sample size consisted of 260 adult participants and the birth order groups ranged in size from 50 to 94, there were not enough participants to gather statistically significant information regarding many of the variables generated by the BOQ, such as an examination of the relationship of sibling's gender to personality traits. However, in regard to the proposed hypotheses, Study 6 found significant birth order differences for both extraversion and openness. The results found that oldest and youngest borns scored higher on both extraversion and openness than middle children. The v-shaped pattern of the extraversion scores lends support to Sulloway's (1995) claims that first and later borns score high on the different facets of extraversion. While previous research utilising a within-family design has linked high openness scores with later borns (Healy & Ellis, 2007; Paulhus et al., 1999), Study 6 used a between-family design and found that it was related to older borns as well with older and younger borns scoring higher than middle children. One of the key advantages of this thesis is that it presents both a between family design as well as a follow up within family design in Chapter 6.

Study 10 investigated the relationship between birth order and the Big Five in a within family design. This study found that first borns score higher than last borns in conscientiousness. Results from this study also found that middle borns score significantly lower than first and last borns in neuroticism. One advantage a within-family design has is the equal distribution of birth order groups, unlike studies such as Shao et al. (2013) who had birth order groups ranging in size from n=68 firstborns to n=575 only children. As the authors indicated, their results may have been skewed by

the uneven birth order groups (Shao et al., 2013). Discrepancies between within family and between family designs highlight the differences in findings for using different types of design. Therefore, whether research is either being reviewed or designed it is very important to consider what kind of design should be implemented as the two studies presented in this thesis yielded very different results. Both designs used the IPIP to measure the Big Five and had ample sample sizes that did not vary drastically in age or language. It can then be argued that differences in results were due to the differences in design; within family and between family designs yield different results based on the notion that within family designs accounts for differences between family structures/SES status.

7.1.2 Birth order and trait EI

As discussed throughout this thesis, Studies 7, 8, 9 and 10 were the first to investigate the relationship between birth order and trait EI. This relationship was examined in four studies consisting of large sample sizes and in both between family and within family designs. The four studies each found no relationship between birth order and trait EI or any of its four factors. Study 8 examined the four trait EI factors as well the 15 facets and found no relationship between the variables. However, these studies did produce a unique finding in regards to trait EI and number of siblings suggesting that the more siblings one grows up with the higher their emotion expression and optimum scores. While this thesis focused mainly on birth order, Adler's view of the family constellation was taken into account when developing the BOQ asserting that ordinal position is not everything. Therefore, information in respect to the number of siblings was analysed as well as birth order.

One great advantage of the BOQ is that it gathers information on the number of

siblings each participant has as well as how many of those siblings grew up in the same house as them the majority of their childhood. Previous studies have not looked into the impact of the number of siblings on personality growing up together. Studies 7 and 9 found a positive relationship between trait EI and the number of siblings that grew up in the same household. This suggests that it is not whether you are a first born or a last born, but it is the number of siblings you grew up with that is related to trait EI. A suggestion for future research includes the need to try and replicate these findings in large scale studies consisting of families of more than three children, this will add validity to the findings presented in this thesis that trait EI increases as the number of siblings grows higher than three.

7.2 Limitations of the Thesis

The set of meta-analyses presented in Chapter 3 are not without their limitations and surround the number of studies included. Several relevant studies could not be included due to the lack of sufficient information available in the results section. Although all authors in these circumstances were contacted, there were instances were the requests were not granted. With the inclusion of more studies the final results of these analyses may have altered. In addition, it would have been beneficial to know what type of measure each study used when investigating the relationship between birth order and each of the Big Five personality dimensions. Additional analyses were run on only the studies that used the NEO-PI-R; additional information would have been helpful to ascertain if there are differences between studies that used other specific measures of assessment.

One variable that could not be examined in the studies in this thesis was how the

gender of one's siblings is related to personality. Does being a female with three brothers differ in personality as opposed to a female with three sisters? Common thought and anecdotal evidence would say yes; how could a male growing up with five sisters not have a different personality that if he grew up with five brothers? Unfortunately, while the sample sizes of the birth order groups throughout this thesis were all of substantial size, they were not large enough to examine this question. This is an area in which future research with larger birth order groups could explore further in addition to the suggestions discussed in the section below.

7.3 Future Research

One overarching theme of this thesis is that different research designs reveal different relationship between birth order and the Big Five. Although the measures of assessment were identical in both Study 6 and Study 10 (IPIP, BOQ, TEIQue), the method of design differed with one being a between family design and the other a within family design. One great advantage of the within family design is that it compares sets of siblings, with each sibling set growing up in a shared environment. In a shared environment, individuals are likely to grow up with shared resources and family structures. It is recommended that all future research use this type of design over the between family design.

Qualitative feedback from the initial pilot study of the BOQ suggests, this survey is a clear and thorough assessment of birth order and its related information. The survey yields specific socio-demographic information regarding not only the participant but also their siblings and parents. More specifically, the survey gathers information on the gender and age of their siblings and the education and occupation of

their parents. While the variables analysed suggest that birth order and personality are not mitigated by factors such as age and gender, overall, the BOQ generates dozens of independent variables that may be of interest to future studies. The optimal way to take full advantage of the BOQ is to generate very large-scale studies. While the sample sizes throughout the ten studies in this thesis all consisted of large groups, in order to study specific gender differences within families and age spacing the number of participants needed to populate these sub-groups is extremely large. However, one of the many benefits of the BOQ is that one can use it and incorporate the variables that are relevant to their research findings. Therefore, it is suggested that future research look into employing one unified measure of birth order and that the BOQ is an easy to administer and understand tool in which to do so. This tool can be used to investigate the relationship between birth order and other variables of interest and is not limited to investigating its relationship with personality.

Birth order research has been and will continue to be a popular topic as people speculate on how it relates to additional variables such as relationships, leadership and career outcome. What we have learned in regard to the BOQ is that while it can be used to gather as many or few data points as one chooses, what makes it unique is the breadth of data it can generate. Therefore, the optimal way to employ the BOQ is with a very large sample size that can allow for those analyses to happen.

The various studies in this thesis consistently found that birth order and trait EI are not related. A youngest born and oldest born do not differ significantly in their trait EI scores. However, the trend in Studies 7 and 9 suggests that the number of children growing up in the same house together is positively correlated to certain facets of trait EI. This implies that when there are more siblings growing up in the same house

together they have a positive correlation of higher trait EI scores. As this was the trend in two studies in this thesis, any future research on this topic should include participants from large sibship sets in order to assess how this trend holds up in a larger sample. Additionally, cross-cultural research is suggested in order to assess if this relationship holds true in cultures with large sibship sizes.

As discussed in Section 1.4.2.3, the applications of trait EI are multi-various as the construct is linked to a number of organizational, clinical, health, social and educational variables. By employing a large sample size, future research may be able to find further evidence to suggest that larger families have higher trait EI scores than smaller families, these findings could have prolific implications in a variety of factors as the topic of EI grows in importance in everything from organizational psychology to parenting techniques. If the idea that trait EI is linked to large sibships, questions in hiring practices may change and parents may rethink how many children they have. As this thesis was the first to study trait EI in this way, it is suggested that further research continues to explore the relationships found and that the BOQ is used in cross-cultural research.

7.4 Concluding Remarks

This thesis has thoroughly explored the relationship between birth order with the Big Five and trait EI through a series of ten studies. The original hypotheses regarding the Big Five were based on the work of Sulloway (1995) and the findings yielded some support for his theory. However, the final conclusions are that birth order effects differ depending on the research design employed. Seeing as Sulloway's theories were based on a theoretical framework, rather than empirical studies, it is not surprising that the

scientific studies presented throughout this thesis did not confirm all of his hypotheses.

What is noteworthy about this thesis is the evidence that different research methods generate different results even when the measures are identical and the sample groups are similar. By using the same measures and similar sample groups in different research designs, such as Studies 6 and 10, one can conclude that the difference in results is due to design. Between-subjects designs yield different results than within-subject designs and future research should focus on the later, as they account for more potential confounding variables. The overall implication of this finding is that birth order differences may continue to yield different results as evidenced by years of research that has produced conflicting results. While the merits of a within-family design are easy to argue, agreeing on unified measures of assessment of both personality and birth order are more difficult as there are many instruments out there with their advantages and disadvantages.

A series of robust studies on the relationship between birth order and trait EI has concluded that there is no relationship between the two variables. The findings do however suggest that there is a positive correlation between trait EI and the number of siblings growing up in the same house together. While there appears to be no relationship between birth order and trait EI, future research is suggested to continue to explore the impact of the number of siblings growing up together and trait EI.

Another important conclusion of this thesis, is that this relationship would not be found if it were not for the magnitude of data collected by the BOQ. While existing birth order questionnaires obtain information regarding ordinal position and perhaps age spacing, this is the first of its kind to also ascertain how many siblings are growing up in a house together. In today's society, families are growing evermore complex and it

becomes more difficult for individuals to answer what was once a straight-forward question such as *How many siblings do you have?* With blended families including, adoptions, sib-siblings, and half siblings birth order research must evolve to account for all of these various variables and the BOQ is an instrument that can be of great assistance in that respect.

Even in light of the findings produced in this thesis, the complex nature in which birth order relates to personality traits will continue to be of interest in both the academic world and in popular culture; as individuals aim to find definitive answers regarding how our upbringing makes us who we are and parents seek answers on how to develop the ideal family structure.

References

Adler, A. (1937). How position in the family constellation influences life-style. *International Journal of Individual Psychology 3,* 211-227.

Adler, A. (1938). *Social interest: A challenge to mankind.* Oxford: Faber and Faber.

Andeweg, R.B., & Van Den Berg, S.B. (2003). Linking birth order to political leadership: The impact of parents or sibling interaction? *Political Psychology, 24(3)*, 605-623.

Andrei, F., & Petrides, K.V. (2013). Trait emotional intelligence and somatic complaints with reference to positive and negative mood. *Psihologija, 46,* 5-15.

Ansbacher, H. L., & Ansbacher, R. R. (Eds.). (1956). *The Individual Psychology of Alfred Adler.* New York: Basic Books.

Argyle, M., & Lu, L. (1990). Happiness and social skills. *Personality and Individual Differences*, *11(12)*, 1255-1261.

Ashton, M.C., & Lee, K. (2007). Empirical, theoretical, and practical advantages of the HEXACO model of personality structure. *Personality and Social Psychology Review, 11,* 150-166.

Badger, J., & Reddy, P. (2009). The effects of birth order on personality traits and feelings of academic sibling rivalry. *Psychology Teaching Review,15,* 45-54.

Bar-On, R. (1997). *BarOn Emotional Quotient Inventory: technical manual*. Toronto: Multi Health Systems Inc.

Barrick, M.R., & Mount, M.K. (1991). The big five personality dimensions and job

performance: A meta-analysis. *Personnel Psychology, 44*, 1-26.

Baskett, L.M. (1985). Sibling status: Adult expectations. *Developmental Psychology, 21,* 441-45.

Beck, E., Burnet, K.L., & Vosper, J. (2006). Birth-order effects on facets of extraversion. *Personality and Individual Differences, 40,* 953-959.

Beer, J.M., & Horn, J.M. (2000). The influence of rearing order on personality development within two adoption cohorts. *Journal of Personality, 68,* 789-819.

Bing, M.N., & Lounsbury, J.W. (2000). Openness and job performance in U.S.-based Japanese manufacturing companies. *Journal of Business and Psychology, 14(3)*, 515-522.

Bjerkedal, T., Kristensen, P., Skjeret, G.A., & Brevik, J.I. (2007). Intelligence test scores and birth order among young Norwegian men (conscripts) analyzed within and between families. *Intelligence, 35(5)*, 503-514.

Borekenau, P., Reimann, R, Angleitner, A., & Spinath, F.M. (2001). Genetic and environmental influences of observed personality: Evidence from the German observational study of adult twins. *Journal of Personality and Social Psychology, 80,* 655-668.

Botwin, B.D., Buss, D.M., & Shackelford, T.K. (1997). Personality and mate preferences: Five factors in mate selection and marital satisfaction. *Journal of Personality, 65(1)*, 107-136.

Bouchard, T.J., & McGue, M. (1990). Genetic and rearing environmental influences on adult

personality: An analysis of adopted twins reared apart. *Journal of Personality, 58*, 263-292.

Buunk, B.P. (1997). Personality, birth order, and attachment styles as related to various types of jealousy. *Personality and Individual Differences, 23*, 997-1006.

Carette, B., Anseeel, F., & Van Yperen, N.W. (2011). Born to learn or born to win? Birth order effects on achievement goals. *Journal of Research in personality, 45*, 500-503.

Carroll, J.B. (1993). *Human cognitive abilities: A survey of factor-analytic studies*. New York: Cambridge.

Cattell, R. B. (1946*). The description and measurement of personality*. New York, NY: Harcourt, Brace, & World.

Cattell, R. B. (1957). *Personality and motivation structure and measurement*. New York, NY: World Book.

Cattell, H. E. P., & Mead, A. D. (2008). The sixteen-personality factor questionnaire (16PF). In G. Boyle, G. Matthews, & D. H. Saklofske, (Eds.) *The SAGE handbook of personality theory and assessment; Vol. 2 Personality measurement and testing* (pp. 135-178). Los Angeles, CA: Sage.

Chamorro-Premuzic, T., & Furnham, A. (2008). Personality, intelligence and approaches to learning as predictors of academic performance. *Personality and Individual Differences, 44*, 1596-1603.

Cheng, H., & Furnham, A. (2002). Personality, peer-relations, and self-confidence as predictors

of happiness and loneliness. *Journal of Adolescence, 25*, 327-339.

Cherniss, C. (2000, April). *Emotional intelligence: what it is and why it matters*. Paper presented at the Annual Meeting of the Society for Industrial and Organizational Psychology, New Orleans, LA.

Ciarrochi, J. Deane, F.P., & Anderson, S. (2002). Emotional intelligence moderates the relationship between stress and mental health. *Personality and Individual Differences*, *32*, 197-209.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.) Hillsdale, NJ, Erlbaum.

Cole, E., & Petrides, K.V. (2010). Birth order effects on extraversion. In A.M. Columbus (Eds.), *Advances in Psychology Research* (Vol. 65; pp. 339-346). New York: Nova Science Publishers.

Conn, S.R., & Rieke, M.L. (1994). The 16PF Fifth Edition technical manual. Champaign, IL: Institute for Personality and Ability Testing, Inc.

Cooper, A., & Petrides, K. V. (2010). A psychometric analysis of the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF) using Item Response Theory. *Journal of Personality Assessment, 92,* 449-457.

Costa, P.T., Jr., & McCrae, R.R. (1992). *Revised NEO personality inventory (Neo-PI-R) and NEO Five-Factor Inventory (NEO-FFI): professional manual.* Odessa, FL: Psychological Assessment Resources.

Costa, P.T., Jr., & McCrae, R.R. (1995). Domains and facets: Hierarchical personality assessment using the Revised NEO Personality Inventory. *Journal of Personality Assessment, 64*, 21-50.

Costa, P.T., Jr., & McCrae, R.R. (1997). Stability and change in personality assessment: The revised NEO personality inventory in the year 2000. *Journal of Personality Assessment, 68(1)*, 86-94.

Costa, P.T., Jr., McCrae, R.R., & Dye, D.A. (1991). Facet scales for agreeableness and conscientiousness: A revision of the NEO Personality Inventory. *Personality and Individual Differences*, *12(9)*, 887-898.

Courtiol, A., Raymond, M., & Faurie, C. (2009). Birth order affects behaviour in the investment game: Firstborns are less trustful and reciprocate less. *Animal Behaviour, 78,* 1405-1411.

Darwin, C.R. (1859). *On the origin of species by means of natural selection*. London: John Murray.

deVries, R.E., de Vries, A., & Feij, J.A. (2009). Sensation seeking, risk-taking, and the HEXACO model of personality. *Personality and Individual Differences, 47*, 536-540.

Dixon, M.M., Reyes, C.J., Leppert, M.F., & Pappas, L.M. (2008). Personality and birth order in large families. *Personality and Individual Differences, 44,* 119-128.

Eckstein, D. Aycock, K.J, Sperber, M.A., McDonald, J., Wiesner, V.V. III, Watts, R.E., & Ginsburg, P. (2010). A Review of 200 Birth-Order Studies: Lifestyle Characteristics.

The Journal of Individual Psychology, 66(4) 408-424.

Ernst, C., & Angst, J. (1983). *Birth-order: Its influence on personality*. New York: Springer-Verlag.

Flynn, F.J. (2005). Having an open mind: The impact of openness to experience on interracial attitudes and impression formation. *Journal of Personality and Social Psychology, 88(5)*, 816-826.

Furnham, A., Chamorro-Premuzic, T., & Moutafi, J. (2005). Personality and intelligence: gender, the Big five, self-estimated and psychometric intelligence. *International Journal of Selection and Assessment, 13(1)*, 11-24.

Furnham, A., & Heaven, P. (1999). *Personality and Social Behaviour*, London: Arnold.

Furnham, A., & Petrides, K.V. (2003). Trait emotional intelligence and happiness. *Social Behavior and Personality*, *31(8)*, 815-824.

Furnham, A., & Zacherl, M. (1986). Personality and job satisfaction. *Personality and Individual Differences*, 7(4), 453-455.

Galton, F. (1874). *English men of science: Their nature and nurture*. London: Macmillan.

Gardner, H. (1983). *Frames of mind: the theory of multiple intelligences* (1st ed.). London: William Heinemann Ltd.

Gates, L., Lineberger, M.R., Crockett, J., & Hubbard, J. (1988) Birth order and its relationship to depression, anxiety, and self-concept test scores in children. *Journal of Genetic Psychology: Research and Theory on Human Development, 149 (1)*, 29-34.

Goleman, D. (1995). *Emotional intelligence*. New York & London: Bantam Books.

Goldberg, L.R. (1990). An alternative 'description of personality': The big-five factor structure. *Journal of Personality and Social Psychology, 59(6)*, 1216-1229.

Goldberg, L.R. (1992). The development of markers for the big-five structure. *Psychological Assessment, 4(1)*, 26-42.

Goldberg, L.R. (1999). A broad-bandwidth, public domain, personality inventory measuring the lower-level facets of several five-factor models. In I. Mervielde, I. Deary, F. De Fruyt, & F. Ostendorf (Eds.), *Personality psychology in Europe* (Vol. 7, pp. 7-28). Tilburg, The Netherlands: Tilburg University Press.

Goldberg, L.R., Johnson, J.A., Eber, H., Hogan, R., Ashton, M.C., Cloninger, C.R., & Gough, H.G. The international personality item pool and the future of public-domain personality measures. *Journal of Research in Personality, 40(1)*, 84-96.

Gordon, J. (2012). Birth order; investigating its effects on personality, empathy, achievement and perceived academic performance. (Dublin Business School Bachelors Thesis).

Greenspan, S.I. (1989). Emotional intelligence. In K. Field, B.J. Cohler, & G. Wool (Eds.), *Learning and education: Psychoanalytic perspectives* (pp. 209-243). Madison, CT: International Universities Press.

Gross, J.J., Sutton, S.K., & Ketelaar, T.V. (1998). Relations between affect and personality: Support for the affect level and affective-reactivity views. *Personality and Social Psychology Bulletin, 24*, 279-288.

Guenole, N., & Chernyshenko, O.S. (2005). The suitability of Goldberg's Big Five IPIP personality markers in New Zealand: A dimensionality, bias and criterion validity evaluation. *New Zealand Journal of Psychology, 34(2)*, 86-96.

Ha, T.S., Tam, C.L. (2013). Relationships of birth order, parent-child relationship, personality and academic performance. *Pertanika Journal of Social Sciences & Humanities, 21(1)*, 17-52.

Healy, M. D. (2008). Effects of birth order on personality: A within-family examination of sibling niche differentiation (Doctoral dissertation). University of Canterbury, Canterbury, UK.

Healy, M.D., & Ellis, B.J. (2007). Birth order, conscientiousness, and openness to experience: Tests of family-nice model of personality using a within-family methodology. *Evolution and Human Behavior, 28*, 55-59.

Herrera, N.C., Zajonc, R.B., Wieczorkowska, G., & Cichomski, B. (2003). Beliefs about birth rank and their reflection in reality. *Journal of Personality and Social Psychology, 85,* 142-150.

Herringer, L.G. (1998). Facets of extraversion related to life satisfaction. *Personality and Individual Differences, 24,* 731-733.

Hertwig, R., Davis, J., & Sulloway, F.J. (2002). Parental Investment: How an equality motive can produce inequality. *Psychological Bulletin*, *128,* 728-45.

Hudson, V. (1990). Birth order and world leaders: An exploratory analysis of effects on

personality and behavior. *Political Psychology*, *11(3)*, 583-601.

Hunter, J.E., & Schmidt, F.L. (2004). Methods of meta-analysis: Correcting error and bias in research findings. Thousand Oaks, CA: Sage Publications Inc.

Jang, K.L., Livesley, W.J., & Vernon, P.A. (1996). Heritability of the big five personality dimensions and their facets: A twin study. *Journal of Personality, 64,* 577-591.

Jung, C.G. (1921). *Psychological types: Collected Works* (Vol. 6). Princeton, NJ: Princeton University Press.

Jefferson, T.J., Herbst, J.H., & McCrae, R.R. (1998). Associations of birth-order and personality traits: evidence from self-reports and observer ratings. *Journal of Research in Personality, 32,* 498-509.

John, O.P. (1990). The 'big five' factor taxonomy: Dimensions of personality in the natural language and in questionnaires. In L.A. Pervin & O.P. John (Eds.) *Handbook of Personality: Theory and research (2nd ed.)* (pp. 66-100). New York: Guildford Press.

John, O.P. & Srivastava, S. (1999). The big five trait taxonomy: History, measurement, and theoretical perspectives. In L.A. Pervin & O.P John (2nd Ed.), *Handbook of Personality: Theory and Research* (pp. 102-138). New York: Guilford Press.

Johnson, G. R. (2000). Science, Sulloway, and birth order: An ordeal and an assessment. *Politics and Life Sciences, 19*, 211-245.

Jokela, M. (2012). Birth-cohort effects in the association between personality and fertility. *Psychological Science, 23(8),* 835-841.

Jylha, P. & Isometsa, E. (2006). The relationship of neuroticism and extraversion to symptoms of anxiety and depression in the general population. *Depression & Anxiety, 23(5)*, 281-189.

Kanazawa, S. (2012). Intelligence, birth order, and family size. *Personality and Social Psychology Bulltein, 38(9):* 1157-1164.

Klein, S. (1984). Birth order and introversion-extraversion. *Journal of Research in Personality, 18*, 110-113.

Kusunoki, T., Mukaida, K., Morimoto, T., Sakuma, M., Yasumi, T., Nishikormori, R., & Heike, T. (2012). Birth order effect on childhood food allergies. *Pediatric Allergy and Immunology, 23,* 250-254.

Laursen, B., Pulkkinen, L., & Adams, R. (2002). The antecedents and correlates of agreeableness in adulthood. *Developmental Psychology, 38(4)*, 591-603.

Lee, K., & Ashton, M.C. (2004). Psychometric properties of the HEXACO Personality Inventory. *Multivariate Behavioral Research, 39*, 329-358.

Lee, K., & Ashton, M.C. (2005). Psychopathy, Machiavellianism, and Narcissism: The Five-Factor Model and the HEXACO model of personality structure. *Personality and Individual Differences, 38,* 1571-1582.

Lee, K., & Ashton, M.C. (2008). The HEXAO personality factors in the indigenous personality lexicons of English and 11 other languagues. *Journal of Personality, 76,* 1001-1053.

Lee, K., Ashton, M.C., Morrison, D.L., Cordery, J., & Dunlop, P.D. (2008). Predicting integrity

with the HEXACO personality model: Use of self-and other reports. *Journal of Occupational and Organizational Psychology, 81,* 147-167.

Leible, T.L., & Snell, W.E. (2004). Borderline personality disorder and multiple aspects of emotional intelligence. *Personality and Individual Differences, 37*, 393-404.

Leong, F.T., Hartung, P.J., Goh, D., & Gaylor, M. (2001). Appraising birth order in career assessment: Linkages to Holland's and Super's Models. *Journal of Career Assessment, 9(1)*, 25-39.

Leuner, B. (1966). Emotionale Intelligenz und Emanzipation [Emotional intelligence and emancipation]. *Praxis der Kinderopsychologie und Kinderpsychiatry*, *15*, 196-203.

Light, R.J., & Smith, P.V. (1971). Accumulating evidence: Procedures for resolving contradictions among different research studies. *Harvard Educational Review, 41*, 429-471.

Lim, B.C., & Ployhart, R.E. (2006). Assessing the convergent and discriminant validity of Goldberg's International Personality Item Pool. *Organizational Research Methods, 9(1)*, 29-54.

Little, B.R., Lucci, L., & Watkinson, B. (1992). Personality and personal projects: Linking the Big Five and PAC units of analysis. *Journal of Personality, 60(2)*, 501-525.

Marini, V.A., & Kurtz, J.E. (2011). Birth order differences in normal personality traits: Perspectives from within and outside the family. *Personality and Individual Differences, 51,* 910-914.

Markus, J., Alvergne, A., Rotkirch, A., Rickard, I.J., & Lummaa, V. (2014). Associations between family size and offspring education depend on aspects of parental personality. *Personality and Individual Differences, 58,* 95-100.

Marni, V.A., & Kurtz, J.E. (2011). Birth order differences in normal personality traits: Perspectives from within and outside the family. *Journal of Personality and Individual Differences, 51*, 910-914.

Mavroveli, S., Petrides, K.V., Rieffe, C., & Bakker, F. (2007). Trait emotional intelligence, psychological well-being and peer-rated social competence in adolescence. *British Journal of Developmental Psychology, 25*, 263-275.

Mayer, J.D., & Salovey, P. (1997). What is emotional intelligence? In P. Salovey & D. Sluyter (Eds.) *Emotional development and emotional intelligence: educational implications* (pp. 3-31). New York: Basic Books.

McBurney, D.H. (1994). *Research Methods*. Pacific Grove: Brooks/Cole.

Michalski, R.L., & Shackelford, T.K. (2002). An attempted replication of the relationships between birth-order and personality. *Journal of Research in Personality, 36*, 182-188.

Mikolajczak, M., Menil, C., & Luminet, O. (2007). Explaining the protective effect of trait emotional intelligence regarding occupational stress: Exploration of emotional labour processes. *Journal of Research in Personality, 41(5),* 1107-1117.

Mikolajczak, M., Petrides, K.V., & Hurry, J. (2009). Adolescents choosing self-harm as an emotion regulation strategy: The protective role of trait emotional intelligence. *British*

Journal of Clinical Psychology, 48, 181-193.

Morley, H. (1891). *Character writings of the seventeenth century*, London: Kessinger Publishing, LLC.

Moutafi, J., Furnham, A., & Crump, J. (2003). Demographic and personality predictors of intelligence: a study using the NEO-Personality Inventory and the Myers-Briggs Type Indicator. *European Journal of Personality, 17*, 79-94.

Moutafi, J., Furnham, A., & Crump, J. (2006). What facets of Openness and Conscientousness predict fluid intelligence score? *Learning and Individual Differences, 16(1)*, 31-42.

Moutafi, J., Furnham, A., & Paltiel, L. (2004). Why is Conscientiousness negatively correlated with intelligence? *Personality and Individual Differences, 37*, 1013-1022.

Moutafi, J., Furnham, A., & Paltiel, L. (2005). Can personality factors predict intelligence? *Personality and Individual Differences, 38*, 1021-1033.

Murphy, K.R., & Dzieweczynski, J.L. (2005). Why don't measures of broad dimensions of personality perform better as predictors of job performance. *Human Performance, 18*, 343-358.

Ones, D.S., Rubenzer, S.J., & Faschingbauer, T.R. (2004). Predicting presidential success. In S. J. Rubenzer & T.R. Faschingbauer (Eds.) *Personality, character, and leadership in the White House: Psychologists assess the presidents* (pp. 38-59). Washington: Bressey's.

Paulhus, D.L., Trapnell, P.D., & Chen, D. (1999) Birth-order effects on personality and achievement within families. *Psychological Science, 10,* 482-488.

Payne, W.L. (1986). A study of emotion: Developing emotional intelligence; self-integration; relating to fear, pain, and desire. *Dissertation Abstracts International*, 47, p. 203A. (University microfilms No. AAC 8605928).

Perez, J.C., Petrides, K.V., & Furnham, A. (2005). Measuring trait emotional intelligence. In R. Schulze and R.D. Roberts (Eds.), *Emotional Intelligence: An International handbook* (pp. 181-201). Cambridge, MA: Hogrefe & Huber.

Petrides, K. V. (Spring, 2006). Internal Consistency Data for the TEIQue and TEIQue-SF (v. 1.50). Web note #1**. http://www.ioe.ac.uk/schools/phd/kpetrides/teique1.htm**

Petrides, K. V. (2009). *Technical manual for the Trait Emotional Intelligence Questionnaires* (TEIQue). London: London Psychometric Laboratory.

Petrides, K.V. (2010). Trait emotional intelligence theory. *Industrial and Organizational Psychology, 3*, 136-139.

Petrides, K.V. (2011). Ability and trait emotional intelligence. In T. Chamorro-Premuzic, S. Von Stumm, & A. Furnham (Eds.), *The Wiley Handbook of Individual Differences* (pp. 656-678). New York: Blackwell Publishing.

Petrides, K.V., Frederickson, N., & Furnham, A. (2004). The role of trait emotional intelligence in academic and deviant behavior at school. *Personality and Individual Differences, 36*, 277-293.

Petrides, K.V., & Furnham, A. (2000a). On the dimensional structure of emotional intelligence. *Personality and Individual Differences*, *29*, 313-320.

Petrides, K.V., & Furnham, A. (2000b). Gender differences in measured and self-estimated trait emotional intelligence. *Sex Roles*, *42 (5/6)*, 449-461.

Petrides, K. V., & Furnham, A. (2003). Trait emotional intelligence: Behavioural validation in two studies of emotion recognition and reactivity to mood induction. *European Journal of Personality, 17,* 39-57.

Petrides, K. V., & Furnham, A. (2006). The role of trait emotional intelligence in a gender-specific model of organizational variables. *Journal of Applied Social Psychology*, *36,* 552-569.

Petrides, K.V., Hurdy, K., Michalaria, G., Swami, V., & Sevdalis, N. (2011). A comparison of the trait emotional intelligence profiles of individuals with and without Asperger syndrome. *Autism, 15(6):* 671-682.

Petrides, K.V., Perez, J.C., & Furnham, A. (2003). The Trait Emotional Intelligence Questionnaire (TEIQue). A measure of emotional self-efficacy. In E.J. Austin & D.H. Saklofske (Chairs), *Emotional Intelligence*. Symposium conducted at the 11th Biennial Meeting of the International Society for the Study of Individual Differences. Graz, Austria.

Petrides, K.V., Pita, R., & Kokkinaki, F. (2007). The location of trait emotional intelligence in personality factor space. *British Journal of Psychology*, *98*, 273-289.

Petrides, K.V., Sangareau, Y., Furnham, A., & Frederickson, N. (2006). Trait emotional intelligence and children's peer relations at school. *Social Development, 15(3),* 437-547.

Phillip, S.M. (1998, February). *Birth order and Personality—Not Again!* Paper presented at the

Annual Meeting of the Eastern Psychological Association, Boston, MA.

Pike, A., & Plomin, R. (1997). A behavioural genetic perspective on close relationships. *International Journal of Behavioral Development, 21*, 647-667.

Platsidou, M. (2010). Trait emotional intelligence of Greek special education teachers in relation to burnout and job satisfaction. *School Psychology International, 31*, 60-76.

Plomin, R., & Daniels, D. (1987). Why are children in the same family so different from one another? *Behavioral and Brain Sciences, 10,* 1-60.

Quoidbach, J., & Hansenne, M. (2009). The impact of trait emotional intelligence on nursing team performance and cohesiveness. *Journal of Professional Nursing, 25(1),* 23-29.

Saad, G., Gill, T., & Nataraajan, R. (2005). Are laterborns more innovative and nonconforming consumers than firstborns? A Darwinian perspective. *Journal of Business Research*, *58(7),* 902-909.

Salmon, C.A., & Daly, M. (1998). Birth Order and Familial Sentiment: Middleborns are Different. *Human Behaviour and Evolution*, *19*, 299-312.

Salmon, C.A., Shackelford, T.K., & Michalski, R.L. (2012). Birth order, sex of child, and perceptions of parental favouritism. *Personality and Individual Differences, 52,* 357-362.

Salovey, P. & Mayer, J.D. (1990). Emotional intelligence. *Imagination, Cognition and Personality*, *9,* 185-211.

Sampson, E. E. (1965). *The study of ordinal position: antecedents and outcomes*. In: V. A.

Maher (Ed.), Progress in Experimental Personality Research. New York: Academic Press,

Sandvik, E., Diener, E., & Seidlitz, L. (1993). Subjective well-being: The convergence and stability of self-report and non-self-report measures. *Journal of Personality, 61(3)*, 317-342.

Saroglou, V. & Fiasse, L. (2003). Birth order, personality and religion: a study among young adults from a three-sibling family. *Personality and Individual Differences, 35*, 19-29.

Schachter, F.F., Gilutz, G., Shore, E., & Adler, M. (1978). Sibling De-identification Judged by Mothers: Cross-validation and Developmental Studies. *Child Development*, *49*, 543-546.

Schooler, C. (1972). Birth order effects: Not here, not now!. *Psychological Bulletin, 78,* 161-175.

Schutte, N.S., Malouff, J.M., Bobik, C., Coston, T.D., Greeson, C., Jedlicka, C., et al. (1998). Development and validation of a measure of emotional intelligence. *Personality and Individual Differences*, *25*, 167-177.

Shao, Y., Yao, X., Li, Y., & Huang, Z. (2013). Personality and life satisfaction in China: The birth order effect under the influence of national policy. *Personality and Individual Differences, 54,* 536-541.

Simonton, D.K. (2006). Presidential IQ, openness, intellectual brilliance, and leadership: Estimates and correlations for 42 U.S. Chief executives. *Political Psychology, 27(4)*,

511-526.

Singh, M., & Woods, S.A. (2008). Predicting general well-being from emotional intelligence and three broad personality traits. *Journal of Applied Social Psychology, 38*, 636-646.

Smith, L., Heaven, P.C.L., & Ciarrochi, J. (2008). Trait emotional intelligence, conflict communication patterns, and relationship satisfaction.

Sternberg, R.J. (1996). *Successful intelligence*. New York: Simon & Schuster.

Sulloway, F.J. (1995). Birth-order and evolutionary psychology: a meta-analytic overview. *Psychological Inquiry, 6,* 75-80.

Sulloway, F.J. (1996). *Born to rebel: Birth-order, family dynamics, and creative lives.* New York: Pantheon Books.

Sulloway, F.J. (2001a). Birth-order, sibling competition, and human behavior. In H.R. Holcomb, III (Ed.), *Conceptual challenges in evolutionary psychology: Innovative research strategies* (pp. 39-83). Dordrecht, the Netherlands: Kluwer Academic.

Sulloway, F.J. (2001b). Sibling-order Effects. In N.J. Smelser and P.B. Baltes (Eds.) *International Encyclopedia of Social and Behavioral Sciences* (Vol 21, pp. 14058-14063). Oxford: Elsevier Science.

Sulloway, F.J. (2002). Technical report on vote-counting meta-analysis of the birth-order literature (1940-1999). http://www.sulloway.org/metaanalysis.html.

Sulloway, F.J. (2007). Birth order and sibling competition. In R. Dunbar and L. Barrett (Eds.) *The Oxford Handbook of Evolutionary Psychology* (pp. 297-311). Oxford: Oxford

University Press.

Sulloway, F.J. (2010). Why siblings are like Darwin's finches: Birth order, sibling competition, and adaptive divergence within the family. In D.M. Buss and P.H. Hawley (Eds.) *The Evolution of Personality and Individual Differences* (pp. 86-119). New York: Oxford University Press.

Sulloway, F.J. & Zweigenhaft, R.L. (2010). Birth order and risk taking in athletics: A meta-analysis and study of major league baseball. *Personality and Social Psychology Review*, *14(4)*, 402-416.

Uziel, L. (2006). The extraverted and the neurotic glasses are of different colors. *Personality and Individual Differences, 41*, 745-754.

Vernon, P.A.; Villani, V.C., Schermer, J.A., Kirilovic, S., Martin, R.A, Petrides, K.V., Spector, T.D., & Cherkas, L.F. (2009). Genetic and environmental correlations between trait emotional intelligence and humor styles. *Journal of Individual Differences*, *30*, 130-137.

Watkins, C.E., Jr. (1984). The individual psychology of Alfred Adler: Toward an Adlerian vocational theory. *Journal of Vocational Behavior, 24*, 28-47.

Wilt, J., & Revelle, W. (2009). Extraversion. In M. Leary & R.H Hoyle (Eds.), *Handbook of Individual Differences in Social Behavior* (pp. 27-45). New York, NY: Guilford Press.

Wu, S., Miao, D., Zhu, X., Luo, Z., & Liu, X. (2007). Personality types of Chinese dental school applicants. *Journal of Dental Education, 71*, 1593-1598.

Zajonc, R.B. (1976). Family configuration and intelligence. *Science, 192*, 227-236.

Zajonc, R.B. (2001). The family dynamics of intellectual development. *American Psychologist, 56,* 490-496.

APPENDIX I

Birth Order Questionnaire (BOQ)

Thank you for taking the time to complete this questionnaire, the responses will be used as part of a psychology research thesis. Your responses are completely anonymous so please answer honestly. In this section you will be asked information about you and your upbringing. Please answer the questions as accurately as you can.

1. Please list your gender and the gender of each of your siblings:

	Male	Female
You	O	O
Sibling 1	O	O
Sibling 2	O	O
Sibling 3	O	O
Sibling 4	O	O
Sibling 5	O	O
Sibling 6	O	O
Sibling 7	O	O
Sibling 8	O	O
Sibling 9	O	O
Sibling 10	O	O

Please indicate which (if any) of the numbers represent step siblings, half siblings, or adopted siblings

2. Please list the dates of birth of you and your siblings in the same order to which you answered the above question. If you do not know the exact dates, please just fill in the year.

	MM	DD	YYYY
You			
Sibling 1			
Sibling 2			
Sibling 3			
Sibling 4			
Sibling 5			
Sibling 6			

Sibling 7			
Sibling 8			
Sibling 9			
Sibling 10			

3. Your Nationality/Nationalities

4. Your current country of residence

5. In which country/countries did you spend most of your childhood?

6. Is English your native language?
   - O Yes
   - O No

7. Your marital status: (please tick all that apply)
   - O Single
   - O Living together
   - O Living together with children
   - O Married no children
   - O Married with children
   - O Divorced/Separated
   - O Widowed

   Other (Please specify)

8. Your current occupation: (please tick all that apply)
   - O Business/Financial
   - O Science/IT/Engineering
   - O Real Estate
   - O Sales

- O Retail/Restaurant
- O Advertising/PR/Marketing
- O Community/Social services
- O Legal
- O Health/Medical
- O Entertainment/Media/Journalism
- O Arts/Design
- O Academic/Teaching
- O Student
- O Not employed

Other (Please specify)

9. Your highest educational qualifications
   - O Some high school
   - O High school diploma/A-levels
   - O Some college
   - O Undergraduate qualification
   - O Post-graduate degree

   Other (Please specify)

10. How many children have you had?
    - O 0
    - O 1
    - O 2
    - O 3
    - O 4
    - O 5
    - O 6
    - O 7
    - O 8
    - O 9
    - O 10

11. Your birth order:
    - O Only child
    - O Oldest child
    - O Middle child
    - O Youngest child

    Other (Please specify and indicate here if you are a multiple). If you do not fit into any one category please explain:

12. How many siblings do you have?

O	0
O	1
O	2
O	3
O	4
O	5
O	6
O	7
O	8
O	9
O	10

13. Growing up, how many of your siblings lived in your house the majority (7+ years) of the time you were there?

O	0
O	1
O	2
O	3
O	4
O	5
O	6
O	7
O	8
C	9
O	10

Please comment on which siblings did not live in the house the majority of time you were there (eg: because of age gaps, half/step siblings, other circumstances):

14. Please list your mother's age at her first child's birth

15. Your parents are currently: (please tick all that apply)

- O Married
- O Separated
- O Divorced
- O Remarried
- O 1 parent deceased
- O Both parents deceased

Other (Please specify)

16. Growing up your parents were: (please tick all that apply)
    - O Married
    - O Separated
    - O Divorced
    - O Remarried
    - O 1 parent deceased
    - O Both parents deceased

    Other (Please specify)

17. Growing up, who did you live with the majority of the time?
    - O Natural mother & natural father
    - O Natural mother & stepfather
    - O Natural father & stepmother
    - O Natural mother & partner
    - O Natural father & partner
    - O Natural mother only
    - O Natural father only
    - O Adoptive parents
    - O Foster parents/social services
    - O Grandparents
    - O Other relatives/person

    Other (Please specify)

18. Your mother's highest educational attainment:
    - O Some high school
    - O High school diploma/A-levels
    - O Some college
    - O Undergraduate qualification

O Post-graduate degree
Other (Please specify)

19. Your father's highest educational attainment:
    O Some high school
    O High school diploma/A-levels
    O Some college
    O Undergraduate qualification
    O Post-graduate degree
    Other (Please specify)

20. Growing up, your mother's occupation: (please tick all that apply)
    O Business/Financial
    O Science/IT/Engineering
    O Real Estate
    O Sales
    O Retail/Restaurant
    O Advertising/PR/Marketing
    O Community/Social services
    O Legal
    O Health/Medical
    O Entertainment/Media/Journalism
    O Arts/Design
    O Academic/Teaching
    O Student
    O Not employed
    Other (Please specify)

21. Growing up, your father's occupation: (please tick all that apply)
    O Business/Financial
    O Science/IT/Engineering
    O Real Estate
    O Sales
    O Retail/Restaurant

- O Advertising/PR/Marketing
- O Community/Social services
- O Legal
- O Health/Medical
- O Entertainment/Media/Journalism
- O Arts/Design
- O Academic/Teaching
- O Student
- O Not employed

Other (Please specify)

APPENDIX II

TEIQue-SF
(Petrides & Furnham, 2006; Cooper & Petrides, 2010)

Instructions: Please answer each statement below by ticking the box that best reflects your degree of agreement or disagreement with that statement. Do not think too long about the exact meaning of the statements. Work quickly and try to answer as accurately as possible. There is no right or wrong answer. There are seven possible responses to each statement ranging from:

1= Completely Disagree 7= Completely Agree

	1	2	3	4	5	6	7
1. Expressing my emotions with words is not a problem for me.	□	□	□	□	□	□	□
2. I often find it difficult to see things from another person's viewpoint	1 □	2 □	3 □	4 □	5 □	6 □	7 □
3. On the whole, I'm a highly motivated person.	1 □	2 □	3 □	4 □	5 □	6 □	7 □
4. I usually find it difficult to regulate my emotions	1 □	2 □	3 □	4 □	5 □	6 □	7 □
5. I generally don't find life enjoyable.	1 □	2 □	3 □	4 □	5 □	6 □	7 □
6. I can deal effectively with people.	1 □	2 □	3 □	4 □	5 □	6 □	7 □
7. I tend to change my mind frequently.	1 □	2 □	3 □	4 □	5 □	6 □	7 □
8. Many times, I can't figure out what emotion I'm feeling.	1 □	2 □	3 □	4 □	5 □	6 □	7 □
9. I feel that I have a number of good qualities.	1 □	2 □	3 □	4 □	5 □	6 □	7 □
10. I often find it difficult to stand up for my rights.	1 □	2 □	3 □	4 □	5 □	6 □	7 □
11. I'm usually able to influence the way other people feel.	1 □	2 □	3 □	4 □	5 □	6 □	7 □
12. On the whole, I have a gloomy perspective on most things	1 □	2 □	3 □	4 □	5 □	6 □	7 □
13. Those close to me often complain that I don't treat them right.	1 □	2 □	3 □	4 □	5 □	6 □	7 □
14. I often find it difficult to adjust my life according to the circumstances	1 □	2 □	3 □	4 □	5 □	6 □	7 □
15. On the whole, I'm able to deal with stress.	1 □	2 □	3 □	4 □	5 □	6 □	7 □
16. I often find it difficult to show my affection to those close to me.	1 □	2 □	3 □	4 □	5 □	6 □	7 □
17. I'm normally able to "get into someone's shoes" and experience their emotions.	1 □	2 □	3 □	4 □	5 □	6 □	7 □
18. I normally find it difficult to keep myself motivated.	1 □	2 □	3 □	4 □	5 □	6 □	7 □

19. I'm usually able to find ways to control my emotions when I want to.	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
20. On the whole, I'm pleased with my life.	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
21. I would describe myself as a good negotiator.	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
22. I tend to get involved in things I later wish I could get out of.	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
23. I often pause and think about my feelings.	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
24. I believe I'm full of personal strengths.	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
25. I tend to "back down" even if I know I'm right.	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
26. I don't seem to have any power at all over other people's feelings.	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
27. I generally believe that things will work out fine in my life.	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
28. I find it difficult to bond well even with those close to me.	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
29. Generally, I'm able to adapt to new environments.	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
30. Others admire me for being relaxed.	1	2	3	4	5	6	7
	□	□	□	□	□	□	□

Thank you very much for your time and cooperation!

APPENDIX III
TEIQue
(Petrides, 2009)

Instructions: Please answer each statement below by ticking the box that best reflects your degree of agreement or disagreement with that statement. Do not think too long about the exact meaning of the statements. Work quickly and try to answer as accurately as possible. There are no right or wrong answers. There are seven possible responses to each statement ranging from:

1= Completely Disagree 7= Completely Agree

	1	2	3	4	5	6	7
1. I'm usually able to control other people	□	□	□	□	□	□	□
2. Generally, I don't take notice of other people's emotions	□	□	□	□	□	□	□
3. When I receive wonderful news, I find it difficult to calm down quickly	□	□	□	□	□	□	□
4. I tend to see difficulties in every opportunity rather than opportunities in every difficulty	□	□	□	□	□	□	□
5. On the whole, I have a gloomy perspective on most things	□	□	□	□	□	□	□
6. I don't have a lot of happy memories	□	□	□	□	□	□	□
7. Understanding the needs and desires of others is not a problem for me	□	□	□	□	□	□	□
8. I generally believe that things will work out fine in my life	□	□	□	□	□	□	□
9. I often find it difficult to recognize what emotion I'm feeling	□	□	□	□	□	□	□
10. I'm not socially skilled	□	□	□	□	□	□	□
11. I find it difficult to tell others that I love them even when I want to	□	□	□	□	□	□	□
12. Others admire me for being relaxed	□	□	□	□	□	□	□

	1	2	3	4	5	6	7
13. I rarely think about old friends from the past	□	□	□	□	□	□	□
14. Generally, I find it easy to tell others how much they really mean to me	□	□	□	□	□	□	□
15. Generally, I must be under pressure to really work hard	□	□	□	□	□	□	□
16. I tend to get involved in things I later wish I could get out of	□	□	□	□	□	□	□
17. I'm able to "read" most people's feelings like an open book	□	□	□	□	□	□	□
18. I'm usually able to influence the way other people feel	□	□	□	□	□	□	□
19. I normally find it difficult to calm angry people down	□	□	□	□	□	□	□
20. I find it difficult to take control of situations at home	□	□	□	□	□	□	□
21. I generally hope for the best	□	□	□	□	□	□	□
22. Others tell me that they admire me for my integrity	□	□	□	□	□	□	□
23. I really don't like listening to my friends' problems	□	□	□	□	□	□	□
24. I'm normally able to "get into someone's shoes" and experience their emotions	□	□	□	□	□	□	□
25. I believe I'm full of personal weaknesses	□	□	□	□	□	□	□

1= Completely Disagree 7= Completely Agree

	1	2	3	4	5	6	7
26. I find it difficult to give up things I know and like	□	□	□	□	□	□	□
27. I always find ways to express my affection to others when I want to	□	□	□	□	□	□	□
28. I feel that I have a number of good qualities	□	□	□	□	□	□	□
29. I tend to rush into things without much planning	□	□	□	□	□	□	□

	1	2	3	4	5	6	7
30. I find it difficult to speak about my intimate feelings even to my closest friends	□	□	□	□	□	□	□
31. I'm not able to do things as well as most people	□	□	□	□	□	□	□
32. I'm never really sure what I'm feeling	□	□	□	□	□	□	□
33. I'm usually able to express my emotions when I want to	□	□	□	□	□	□	□
34. When I disagree with someone, I usually find it easy to say so	□	□	□	□	□	□	□
35. I normally find it difficult to keep myself motivated	□	□	□	□	□	□	□
36. I know how to snap out of my negative moods	□	□	□	□	□	□	□
37. On the whole, I find it difficult to describe my feelings	□	□	□	□	□	□	□
38. I find it difficult not to feel sad when someone tells me about something bad that happened to them	□	□	□	□	□	□	□
39. When something surprises me, I find it difficult to get it out of my mind	□	□	□	□	□	□	□
40. I often pause and think about my feelings	□	□	□	□	□	□	□
41. I tend to see the glass as half-empty rather than as half-full	□	□	□	□	□	□	□
42. I often find it difficult to see things from another person's viewpoint	□	□	□	□	□	□	□
43. I'm a follower, not a leader	□	□	□	□	□	□	□
44. Those close to me often complain that I don't treat them right	□	□	□	□	□	□	□
45. Many times, I can't figure out what emotion I'm feeling	□	□	□	□	□	□	□
46. I couldn't affect other people's feelings even if I wanted to	□	□	□	□	□	□	□

	1	2	3	4	5	6	7
47. If I'm jealous of someone, I find it difficult not to behave badly towards them	□	□	□	□	□	□	□
48. I get stressed by situations that others find comfortable	□	□	□	□	□	□	□
49. I find it difficult to sympathize with other people's plights	□	□	□	□	□	□	□

1= Completely Disagree 7= Completely Agree

	1	2	3	4	5	6	7
50. In the past, I have taken credit for someone else's input	□	□	□	□	□	□	□
51. On the whole, I can cope with change effectively	□	□	□	□	□	□	□
52. I don't seem to have any power at all over other people's feelings	□	□	□	□	□	□	□
53. I have many reasons for not giving up easily	□	□	□	□	□	□	□
54. I like putting effort even into things that are not really important	□	□	□	□	□	□	□
55. I always take responsibility when I do something wrong	□	□	□	□	□	□	□
56. I tend to change my mind frequently	□	□	□	□	□	□	□
57. When I argue with someone, I can only see my point of view	□	□	□	□	□	□	□
58. Things tend to turn out right in the end	□	□	□	□	□	□	□
59. When I disagree with someone, I generally prefer to remain silent	□	□	□	□	□	□	□
60. If I wanted to, it would be easy for me to make someone feel bad	□	□	□	□	□	□	□
	1	2	3	4	5	6	7
61. I would describe myself as a calm person	□	□	□	□	□	□	□
62. I often find it difficult to show my affection to those close to me	□	□	□	□	□	□	□
63. There are many reasons to expect the worst in life	□	□	□	□	□	□	□

	1	2	3	4	5	6	7
64. I usually find it difficult to express myself clearly	□	□	□	□	□	□	□
65. I don't mind frequently changing my daily routine	□	□	□	□	□	□	□
66. Most people are better liked than I am	□	□	□	□	□	□	□
67. Those close to me rarely complain about how I behave toward them	□	□	□	□	□	□	□
68. I usually find it difficult to express my emotions the way I would like to	□	□	□	□	□	□	□
69. Generally, I'm able to adapt to new environments	□	□	□	□	□	□	□
70. I often find it difficult to adjust my life according to the circumstances	□	□	□	□	□	□	□
71. I would describe myself as a good negotiator	□	□	□	□	□	□	□
72. I can deal effectively with people	□	□	□	□	□	□	□
73. On the whole, I'm a highly motivated person	□	□	□	□	□	□	□
74. I have stolen things as a child	□	□	□	□	□	□	□

1= Completely Disagree 7= Completely Agree

	1	2	3	4	5	6	7
75. On the whole, I'm pleased with my life	□	□	□	□	□	□	□
76. I find it difficult to control myself when I'm extremely happy	□	□	□	□	□	□	□
77. Sometimes, it feels like I'm producing a lot of good work effortlessly	□	□	□	□	□	□	□
78. When I take a decision, I'm always sure it is the right one	□	□	□	□	□	□	□
79. If I went on a blind date, the other person would be disappointed with my looks	□	□	□	□	□	□	□
80. I normally find it difficult to adjust my behaviour according to the people I'm with	□	□	□	□	□	□	□

	1	2	3	4	5	6	7
81. On the whole, I'm able to identify myself with others	□	□	□	□	□	□	□
82. I try to regulate pressures in order to control my stress levels	□	□	□	□	□	□	□
83. I don't think I'm a useless person	□	□	□	□	□	□	□
84. I usually find it difficult to regulate my emotions	□	□	□	□	□	□	□
85. I can handle most difficulties in my life in a cool and composed manner	□	□	□	□	□	□	□
86. If I wanted to, it would be easy for me to make someone angry	□	□	□	□	□	□	□
87. On the whole, I like myself	□	□	□	□	□	□	□
88. I believe I'm full of personal strengths	□	□	□	□	□	□	□
89. I generally don't find life enjoyable	□	□	□	□	□	□	□
90. I'm usually able to calm down quickly after I've got mad at someone	□	□	□	□	□	□	□
91. I can remain calm even when I'm extremely happy	□	□	□	□	□	□	□
92. Generally, I'm not good at consoling others when they feel bad	□	□	□	□	□	□	□
93. I'm usually able to settle disputes	□	□	□	□	□	□	□
94. I never put pleasure before business	□	□	□	□	□	□	□
95. Imagining myself in someone else's position is not a problem for me	□	□	□	□	□	□	□
96. I need a lot of self-control to keep myself out of trouble	□	□	□	□	□	□	□
97. It is easy for me to find the right words to describe my feelings	□	□	□	□	□	□	□

98. I expect that most of my life will be enjoyable	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
99. I am an ordinary person	1	2	3	4	5	6	7
	□	□	□	□	□	□	□

1= Completely Disagree 7= Completely Agree

100. I tend to get "carried away" easily	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
101. I usually try to resist negative thoughts and think of positive alternatives	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
102. I don't like planning ahead	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
103. Just by looking at somebody, I can understand what he or she feels	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
104. Life is beautiful	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
105. I normally find it easy to calm down after I have been scared	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
106. I want to be in command of things	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
107. I usually find it difficult to change other people's opinions	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
108. I'm generally good at social chit-chat	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
109. Controlling my urges is not a big problem for me	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
110. I really don't like my physical appearance	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
111. I tend to speak well and clearly	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
112. On the whole, I'm not satisfied with how I tackle stress	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
113. Most of the time, I know exactly why I feel the way I do	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
114. I find it difficult to calm down after I have been strongly surprised	1	2	3	4	5	6	7
	□	□	□	□	□	□	□

	1	2	3	4	5	6	7
115. On the whole, I would describe myself as assertive	□	□	□	□	□	□	□
116. On the whole, I'm not a happy person	□	□	□	□	□	□	□
117. When someone offends me, I'm usually able to remain calm	□	□	□	□	□	□	□
118. Most of the things I manage to do well seem to require a lot of effort	□	□	□	□	□	□	□
119. I have never lied to spare someone else's feelings	□	□	□	□	□	□	□
120. I find it difficult to bond well even with those close to me	□	□	□	□	□	□	□
121. I consider all the advantages and disadvantages before making up my mind	□	□	□	□	□	□	□
122. I don't know how to make others feel better when they need it	□	□	□	□	□	□	□
123. I usually find it difficult to change my attitudes and views	□	□	□	□	□	□	□
124. Others tell me that I rarely speak about how I feel	□	□	□	□	□	□	□

1= Completely Disagree 7= Completely Agree

	1	2	3	4	5	6	7
125. On the whole, I'm satisfied with my close relationships	□	□	□	□	□	□	□
126. I can identify an emotion from the moment it starts to develop in me	□	□	□	□	□	□	□
127. On the whole, I like to put other people's interests above mine	□	□	□	□	□	□	□
128. Most days, I feel great to be alive	□	□	□	□	□	□	□
129. I tend to get a lot of pleasure just from doing something well	□	□	□	□	□	□	□
130. It is very important to me to get along with all my close friends and family	□	□	□	□	□	□	□
131. I frequently have happy thoughts	□	□	□	□	□	□	□

	1	2	3	4	5	6	7
132. I have many fierce arguments with those close to me	□	□	□	□	□	□	□
133. Expressing my emotions with words is not a problem for me	□	□	□	□	□	□	□
134. I find it difficult to take pleasure in life	□	□	□	□	□	□	□
135. I'm usually able to influence other people	□	□	□	□	□	□	□
136. When I'm under pressure, I tend to lose my cool	□	□	□	□	□	□	□
137. I usually find it difficult to change my behaviour	□	□	□	□	□	□	□
138. Others look up to me	□	□	□	□	□	□	□
139. Others tell me that I get stressed very easily	□	□	□	□	□	□	□
140. I'm usually able to find ways to control my emotions when I want to	□	□	□	□	□	□	□
141. I believe that I would make a good salesperson	□	□	□	□	□	□	□
142. I lose interest in what I do quite easily	□	□	□	□	□	□	□
143. On the whole, I'm a creature of habit	□	□	□	□	□	□	□
144. I would normally defend my opinions even if it meant arguing with important people	□	□	□	□	□	□	□
145. I would describe myself as a flexible person	□	□	□	□	□	□	□
146. Generally, I need a lot of incentives in order to do my best	□	□	□	□	□	□	□
147. Even when I'm arguing with someone, I'm usually able to take their perspective	□	□	□	□	□	□	□
148. On the whole, I'm able to deal with stress	□	□	□	□	□	□	□

149. I try to avoid people who may stress me out	1	2	3	4	5	6	7
	□	□	□	□	□	□	□

1= Completely Disagree 7= Completely Agree

150. I often indulge without considering all the consequences	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
151. I tend to "back down" even if I know I'm right	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
152. I find it difficult to take control of situations at work	1	2	3	4	5	6	7
	□	□	□	□	□	□	□
153. Some of my responses on this questionnaire are not 100% honest	1	2	3	4	5	6	7
	□	□	□	□	□	□	□

Thank you very much for your time and cooperation!

APPENDIX IV

IPIP
(Goldberg, 1999)

Below you will find a list of phrases describing behaviour. Please use the rating scale to describe how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your response will be kept in absolute confidence. Please read each statement carefully, and then fill in the bubble that corresponds to your reply

1= Very Accurate 3= Neither Inaccurate nor accurate 5= Very Accurate

1. I tend to vote for conservative political candidates	1 □	2 □	3 □	4 □	5 □
2. I have frequent mood swings	1 □	2 □	3 □	4 □	5 □
3. I am not easily bothered by things	1 □	2 □	3 □	4 □	5 □
4. I suspect hidden motives in others	1 □	2 □	3 □	4 □	5 □
5. I enjoy hearing new ideas	1 □	2 □	3 □	4 □	5 □
6. I believe in the importance of art	1 □	2 □	3 □	4 □	5 □
7. I have a vivid imagination	1 □	2 □	3 □	4 □	5 □
8. I am the life of the party	1 □	2 □	3 □	4 □	5 □
9. I am skilled in handling social situations	1 □	2 □	3 □	4 □	5 □
10. I am always prepared	1 □	2 □	3 □	4 □	5 □
11.I make plans and stick to them	1 □	2 □	3 □	4 □	5 □
12. I dislike myself	1 □	2 □	3 □	4 □	5 □
13. I respect myself	1 □	2 □	3 □	4 □	5 □
14. I insult people	1 □	2 □	3 □	4 □	5 □
15. I would describe my experiences as somewhat dull	1 □	2 □	3 □	4 □	5 □
16. I seldom feel blue	1 □	2 □	3 □	4 □	5 □

	1	2	3	4	5
17. I don't draw attention to myself	□	□	□	□	□
	1	2	3	4	5
18. I carry out my plans	□	□	□	□	□
19. I am not interested in abstract ideas	1 □	2 □	3 □	4 □	5 □
	1	2	3	4	5
20. I have a sharp tongue	□	□	□	□	□
	1	2	3	4	5
21. I make friends easily	□	□	□	□	□
22. I tend to vote for liberal candidates	1 □	2 □	3 □	4 □	5 □
	1	2	3	4	5
23. I know how to captivate people	□	□	□	□	□
24. I believe that others have good intentions	1 □	2 □	3 □	4 □	5 □

1= Very Accurate 3= Neither Inaccurate nor accurate 5= Very Accurate

	1	2	3	4	5
25. I am very pleased with myself	□	□	□	□	□
	1	2	3	4	5
26. I do just enough work to get by	□	□	□	□	□
27. I find it difficult to get down to work	1 □	2 □	3 □	4 □	5 □
28. I carry the conversation to a higher level	1 □	2 □	3 □	4 □	5 □
	1	2	3	4	5
29. I panic easily	□	□	□	□	□
	1	2	3	4	5
30. I avoid philosophical discussions	□	□	□	□	□
	1	2	3	4	5
31. I accept people as they are	□	□	□	□	□
32. I do not enjoy going to art museums	1 □	2 □	3 □	4 □	5 □
	1	2	3	4	5
33. I pay attention to details	□	□	□	□	□
	1	2	3	4	5
34. I keep in the background	□	□	□	□	□
	1	2	3	4	5
35. I feel comfortable with myself	□	□	□	□	□
	1	2	3	4	5
36. I waste my time	□	□	□	□	□
	1	2	3	4	5
37. I get back at others	□	□	□	□	□

	1	2	3	4	5
38. I get chores done right away	□	□	□	□	□
	1	2	3	4	5
39. I don't talk a lot	□	□	□	□	□
	1	2	3	4	5
40. I am often down in the dumps	□	□	□	□	□
	1	2	3	4	5
41. I shirk my duties	□	□	□	□	□
	1	2	3	4	5
42. I do not like art	□	□	□	□	□
	1	2	3	4	5
43. I often feel blue	□	□	□	□	□
	1	2	3	4	5
44. I cut others to pieces	□	□	□	□	□
	1	2	3	4	5
45. I have a good word for everyone	□	□	□	□	□
	1	2	3	4	5
46. I don't see things through#	□	□	□	□	□
	1	2	3	4	5
47. I feel comfortable around people	□	□	□	□	□
	1	2	3	4	5
48. I make people feel at ease	□	□	□	□	□
	1	2	3	4	5
49. I rarely get irritated	□	□	□	□	□
	1	2	3	4	5
50. I have little to say	□	□	□	□	□

Thank you very much for your time and cooperation!